Expedition 14: Make Your Own Evaporite
(suitable for grades 1-3)

Objective:
To make an **evaporite**, a deposit of salt that forms when salty water evaporates. Evaporites are found on land, such as at the Bonneville Salt Flats in Utah, and at some locations in the ocean, such as the eastern Mediterranean Sea.

How this is related to Deep Hypersaline Anoxic Basins (DHABs):
DHABs form when an earthquake or other tectonic activity brings seawater into contact with huge deposits of salt, called evaporites, that lie beneath the seafloor. But where did the salt deposits come from?

Marine geologists found that in some parts of the ocean, immense salt deposits—some hundreds of kilometers wide and up to 10 kilometers (6.2 miles) thick—were produced when part of an ancient sea became shallower and evaporated over a period of hundreds of thousands to millions of years. Several factors could make a large body of water shrink and eventually disappear: uplift of continental plates, lower rainfall, less river flow into the sea, or higher air temperatures, for example.

Every cubic meter of seawater contains more than 2 pounds (0.9 kilograms or 900 grams) of salt, and when the water evaporates, all that salt is left behind. In this demonstration you will create your own miniature evaporite.

Materials you will need:
Beaker or glass
Tap water
Table salt, about one tablespoon for each cup of water
Spoon or stirring rod
Wide pan, such as a cookie sheet or roasting pan

What you do:
1. Pour about a cup of tap water into the beaker. Add a bit less than a tablespoon of salt. This is enough to make the water about as salty as seawater. Stir with the spoon until the salt is dissolved. A few grains may remain at the bottom. (More salt will dissolve if the water is warm than if it is cold.)

2. Set your pan in a place where it will be undisturbed for a few days. The experiment will go faster if the pan is in a warm place, such as near a heat register or by a window where it will get sunshine during the day.

3. Gently pour your salt water into the pan, being careful not to spill any.

4. Leave the pan and water alone. Check it twice a day and make notes on what you see.

More challenges for more advanced classes:

1. If the bottom of your pan was not perfectly flat, the water in the deeper part will take longer to evaporate and you will see a salty "shoreline" around the deeper part. Eventually, all the water will disappear. Is the evaporite thicker in one part of the pan than another?

2. Observe the evaporite. Does this salt look the same as the salt you started with? Imagine what might happen to the evaporite if it became covered with more salt and with heavy sediments such as sand or clay.

3. Weigh the salt before you dissolve it in the water. At the end of the experiment, carefully scrape all the salt from your pan and weigh it. Is it the same amount as at the beginning?

4. Try making an extra-salty brine. Add more salt to the water than you did the first time. Then repeat the remaining steps. What does the evaporite look like this time? Does the water take the same amount of time to evaporate?