Reappearing Salt Activity Sheet

Name: Teacher Guide _____ **Date:** _____

Instructions:

1. Gather your materials to dissolve and evaporate salt!
    a. Table Salt, teaspoon, measuring cup, pitcher (or cups if making smaller portions), watch glasses (or small glass containers that are oven-safe), water, stir stick, magnifying glass, black construction paper, source to evaporate (oven, sun, heat lamp, or hot plate)

Answers will vary. We have provided suggested responses and thinking to look for.

Explore the Salt:

2. Lay out your black construction paper in front of you and put a teaspoon of salt onto it.

3. Look at the salt through a magnifying glass and draw or write down your observations and hypotheses:
    a. What do you see?
        I see very tiny square blocks that look like clear cubes.

    b. What do you think will happen if you put the salt in the water?
        Look for students to understand that the salt will dissolve in the water but that it may sink first and not dissolve until it is stirred. This is especially true of larger salt crystals like those in Hawaiian salt or "rock salt."

    c. What do you think will happen if you evaporate the water from the glass?
        Students may predict that the water will evaporate into the air as a gas but that the salt will be left behind. Some students, however, will think the salt will also evaporate, leaving an empty glass.

Make a Large Batch of Saltwater:

4. Measure out 3 1/2 teaspoons of salt into a pitcher (about 20 grams).

5. Add 4 1/4 cups of water (about 1000 mL).

6. Stir the salt and water mixture.

7. If using food grade salt, taste the mixture using a clean spoon.

Evaporate Saltwater:

8. Pour small portions of your saltwater into your glass containers.

9. Evaporate the water:

    a. **In the oven**:

        i. Bake the samples in an oven on a baking sheet until all the liquid has evaporated.

        ii. Keep the oven temperature under 95˚C (≈200˚F).

    b. **With the sun:**

        i. Place the samples on a window sill or somewhere with direct sunlight.

        ii. Let the water evaporate naturally; this may take days to weeks, depending on the amount of water used.

        iii. Revisit the cups regularly to observe the progress of evaporation.

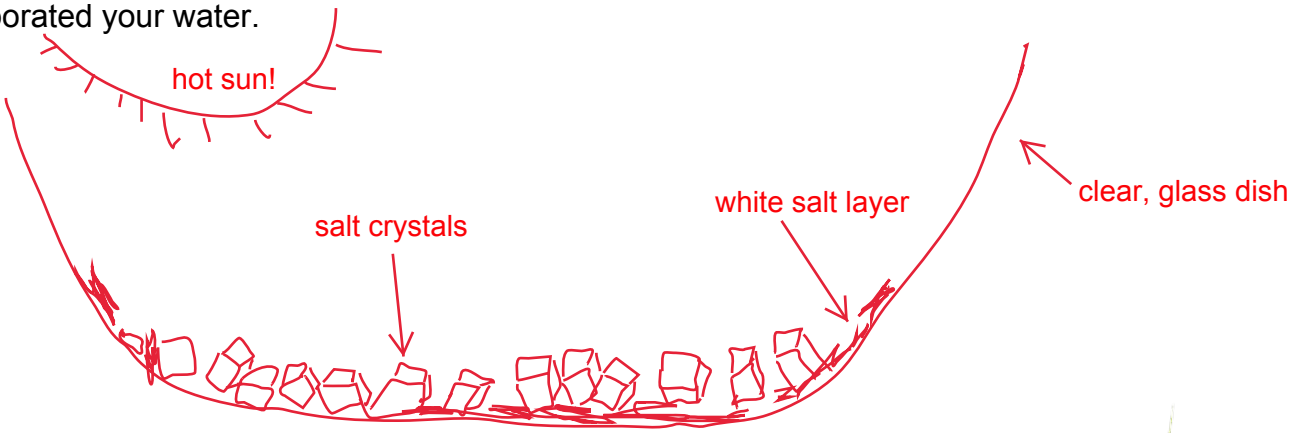
    c. **Using a heat lamp or hot plate:**

        i. Heat the samples to no more than 60˚C. Do not let the water boil.

        ii. When the water is almost gone and the crystals look slightly wet, you can remove the remaining water by turning up the heat a little until the crystals are dry.

        iii. If the crystals begin sputtering, turn down the heat.

10. When all of the water is gone, examine the salt crystals under a magnifying glass again. Write or draw your observations. Include a descriptive label that explains how you evaporated your water.



Description: I evaporated my salt water outside on a hot, dry day using sunlight. I used a small, clear glass dish to hold my salt water. It took about 6 hours for all the water to evaporate. I was left with large, whitish-clear salt crystals. They are pretty big, and some of them are very squarish cubes! Other parts of my dish, especially the sides, look like white powdery salt layers. But, using my magnifying glass, I can see some very small crystal in the white areas!

Activity Questions

1. What happened when you added salt to the water?

   Some of it sank and some of it dissolved.

2. Can you see the salt in the water after you stirred it?

   No. After I stirred the water, I could not see the salt.

   Note: if you add a large amount of salt to water, you may notice that it is cloudier than pure water, but you still cannot see the individual salt particles.

3. Where does the ocean get its salt?

   The salt in the ocean mostly comes from the land. It is carried by streams and rivers to the ocean.

4. What does this activity tell you about the materials in the ocean?

   There is matter in the ocean water that I cannot see. I think there is probably matter in streams and rivers that I cannot see. In fact, there is matter in my drinking water too — and not just H20; there are dissolved salts in tap water and bottled water. If you purchase distilled water, it is closer to pure H20, but it is not drinkable!

5. You have just established that you can't see salt when it's dissolved in water, but you know that it's there. Can you think of other examples of matter that you know is there but can't see? (Hint: think about sugar, food coloring, or a fire)

   When I smell something in the air, there are small particles floating around (even if I cannot see them). This includes nice smells like flowers and cookies as well as yucky smells like farts!

6. How does this activity help you to understand that matter is too small to be seen?

   The performance expectation for this activity is that students develop a model to describe that matter is made of particles too small to be seen. is all around us even when it

   Look for students to understand that some matter, like particles in the air, is too small to be seen—but that we can collect evidence that it is there. For example, we can smell things in the air and we can evaporate salt water, which may look absolutely clear to our eyes, and leave behind salt crystals.

   Also look for students to understand that the matter they can see, such as plants, animals, and salt crystals, is made up of smaller particles that we cannot see. It is only when enough particles collect together that we can see them.

   In this activity, students started with something they could see (salt crystals), dissolved them in water (which separates the individual particles so they are not longer visible), and then returned the salt to a visible state of collected salt particles, crystals, that are visible. By making the changes themselves, students should better understand the concept that salt crystals are made up of smaller particles they cannot see individually and then apply this experience to their thinking about other types of matter.