5th Grade - Lesson 1.3 **Name: _____**

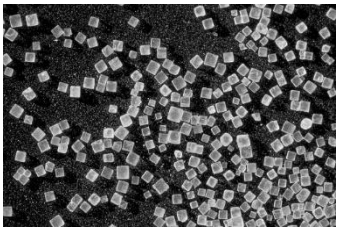
Activity Sheet

Dissolving and Back Again **Date: _____**

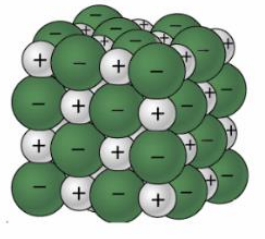
Safety: Wear safety glasses or goggles, and be sure to follow all safety instructions given by your teacher. Wash your hands after completing the activity.

DEMONSTRATION

As a demonstration, you saw a photo of magnified salt crystals and a model of a salt crystal showing that it is made up of sodium and chloride ions.



Magnified Salt Crystals



Salt Crystal Model

1. What keeps the sodium and chloride ions together in a salt crystal?
   The sodium ion has a positive charge and the chlorine ion has a negative charge. Positive and negative attract so the sodium and the chlorine attract each other and stick together.

ACTIVITY

Question to investigate:

What happens when salt is dissolved in water and the water evaporates?

Materials

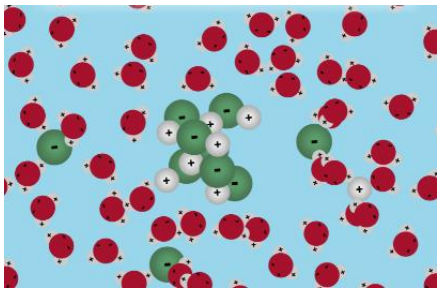
- Kosher salt
- Teaspoon
- Water
- Clear plastic cup
- Petri dish or other shallow container, such as the lid from a yogurt container

Procedure

1. Add 1 teaspoon of salt to a clear plastic cup.
2. Add about 20 milliliters of water to the cup containing the salt and swirl until most or all the salt dissolves.
3. Pour the salt water into a shallow container, such as a Petri dish or yogurt container lid, and set aside for 24 hours.

EXPLAIN IT WITH ATOMS AND MOLECULES

2. You saw an animation of water dissolving salt. In a couple of sentences, explain how water dissolves salt. Be sure to include details about the water molecule and the sodium and chloride ions.



The water molecules have an area of positive charge and an area of negative charge. The salt is made up of positive sodium ions and negative chlorine ions. The positive part of the water molecule attracts the negative chlorine, and the negative part of the water molecules attracts the positive sodium ions. When enough water molecules attract hard enough, the sodium and chlorine come apart and the salt dissolves.

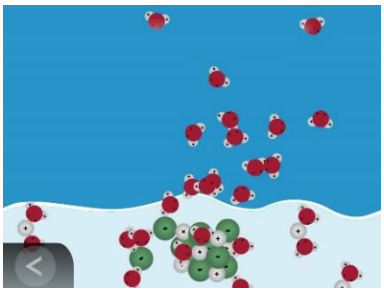
NEXT DAY

WHAT DO YOU OBSERVE?

3. Observe the contents of the shallow salt water container the next day. Describe what you see. There are square or cube-looking salt crystals.

EXPLAIN IT WITH ATOMS AND MOLECULES

4. You saw an animation of salt water evaporating and the salt recrystallizing.



In a couple of sentences, describe what happened to make the salt crystals form again. Be sure to mention the charges of the sodium and chloride ions.

When the water evaporates, the water molecules are not attracting the sodium and chloride ions anymore so they can attract each other and form salt crystals again.

TAKE IT FURTHER

5. Evaporation is a change of state from a liquid to a gas.
   Freezing is a change of state from a _Liquid__ to a _Solid_.

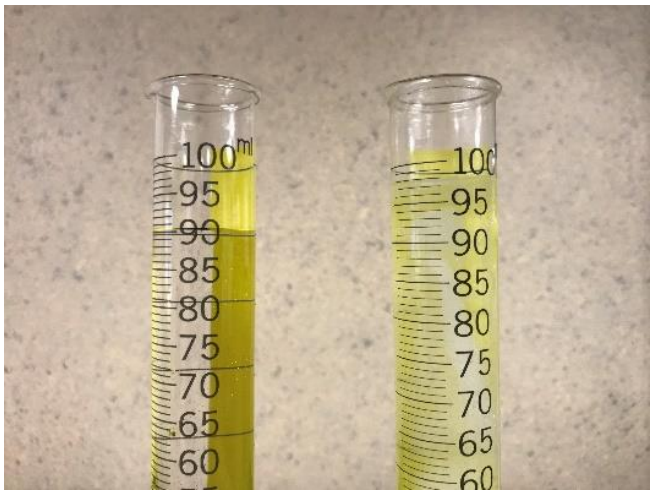
6. Circle the correct answer: After liquid water freezes to form ice, the water molecules in the ice are

   a. Closer together than in liquid water.

   b. Further apart than in liquid water.

   c. The same distance as in liquid water.

7. In these "Before" and "After" pictures, the same amount of water was added to each cylinder and then one was put in the freezer.



Before **After**

Using what you know about water molecules in liquid water and in ice, explain why the frozen water (ice) takes up more space than the liquid water.

The frozen water takes up more space than the same amount of liquid water. This is because the water molecules in ice are further apart than in liquid water so the ice takes up more room than the liquid water.