5th Grade -Lesson 2.1 **Name: _____**
Activity Sheet
Using Dissolving to Identify Substances **Date: _____**

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

INTRODUCTION

1. If you want to design an experiment to compare the amount of salt and sugar that dissolves in water, why is it important to use the same amount of salt and sugar in your "dissolving test"?
   If you want to compare the dissolving of salt and sugar in water, it makes sense to use the same amount of salt and sugar to begin with. If you used different amounts to start, it would be very difficult to tell whether more or less of one or the other dissolved.

2. Should you also use the same amount of water when you test salt and sugar in your dissolving test? Explain.
   You should use the same amount of water in a dissolving test. You are trying to see how much of a substance will dissolve in a certain amount of water so you should keep the amount of substance the same and the amount of water the same.

ACTIVITY

Question to Investigate:

Can you identify substances based on how well they dissolve in water?

Materials

- Sugar in labeled cup
- Salt in labeled cup
- Cup labeled A (containing unknown white solid)
- Cup labeled B (containing unknown white solid)
- Cup labeled C (containing unknown white solid)
- 3 empty clear plastic cups labeled A, B, and C
- Water
- Measuring spoon (½-teaspoon and 1-teaspoon)
- Graduated cylinder

Procedure

1. Place ½ teaspoon of salt and ½ teaspoon of sugar into their labeled cups.
2. Measure 10 milliliters (2 teaspoons) of water to two separate cups.
3. At the same time, pour the water into the sugar and salt cups.
4. Swirl the cups to see how fast and how much sugar and salt dissolve in water.

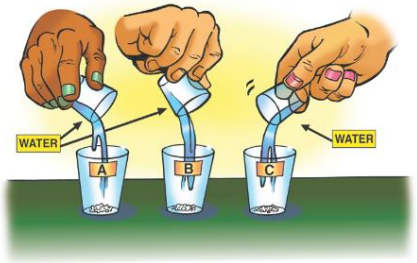
WHAT DID YOU OBSERVE?

3. When you did your dissolving test on the salt and sugar, what did you observe?
   The sugar dissolved completely but there was still some salt left in the water, which did not dissolve.

TESTING SUBSTANCES, A, B, and C

Procedure

5. Place ½ teaspoon of solid from cup A into empty cup A.
   Place ½ teaspoon of solid from cup B into empty cup B.
   Place ½ teaspoon of solid from cup C into empty cup C.
6. Measure 10 milliliters of water (2 teaspoons) into 3 empty cups.
7. At the same time, you and a partner pour the water into cups A, B, and C. Gently swirl the cups to observe and compare which unkown solid dissolves most similarly to sugar, salt, or something else.

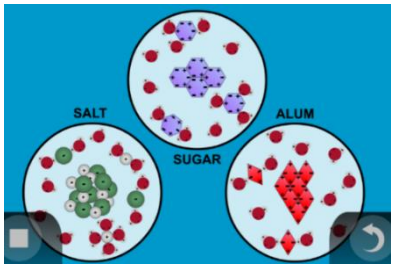


4. Which cup do you think had the sugar?
   Cup B had the sugar.

   Which cup do you think had the salt?
   Cup C had the salt.

   Which cup do you think had a different substance?
   Cup A had something else.

EXPLAIN IT WITH ATOMS & MOLECULES



5. You saw an animation of models of salt, sugar, and alum being dissolved by water molecules. What is it about the different substances that makes them dissolve differently?

Different atoms and molecules have different amounts of positive and negative charges on them in different places. The atoms and molecules are also held together in different arrangements. The positive and negative areas of water molecules interact with them differently and so they dissolve to different extents.

TAKE IT FURTHER

You saw a demonstration where salt, sugar, and alum were added to dirty water.

6. After 15 – 20 minutes, what did you notice about the dirty water in the three cups?

   The alum made the dirty water look a lot clearer. The salt and sugar didn't seem to clean the dirty water.

7. Substances have their own characteristic properties. Based on this experiment, what would you say is one of the characteristic properties of alum?

   One of the characteristic properties of alum is that it can make dirty water get clearer.