

**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 to the amount of sugar that dissolves in water, why is it important to use the same amount of salt and sugar in your “dissolving test”?
  
2. Should you also use the same amount of water when you test salt and sugar in your dissolving test? Explain.

## **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
- 3 empty cups (to measure and pour water from)
- Water
- Measuring spoon (½-teaspoon and 1-teaspoon)
- Graduated cylinder

### Procedure

1. Place  $\frac{1}{2}$  teaspoon of salt and  $\frac{1}{2}$  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. Gently swirl the cups to see how fast and how much sugar and salt dissolve in water.



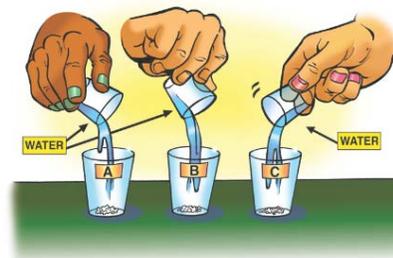
### WHAT DID YOU OBSERVE?

3. When you did your dissolving test on the salt and sugar, what did you observe?

### TESTING SUBSTANCES, A, B, and C

#### Procedure

5. Place  $\frac{1}{2}$  teaspoon of solid from cup A into dry, empty cup A. Place  $\frac{1}{2}$  teaspoon of solid from cup B into dry, empty cup B. Place  $\frac{1}{2}$  teaspoon of solid from cup C into dry, 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 unknown solid dissolves most similarly to sugar and salt. Also note whether any of the powders could be something other than sugar or salt based on how it dissolved.



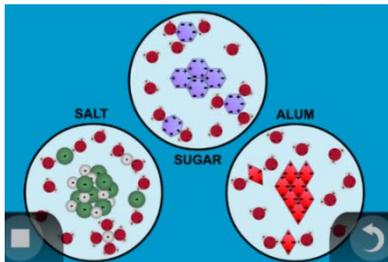
4. Which cup do you think had the sugar? \_\_\_\_\_

Which cup do you think had the salt? \_\_\_\_\_

Which cup do you think had a different substance? \_\_\_\_\_

## 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?



## 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?



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