How Long Will It Take?

Eighth Grade
Activity: 2
Time: 1 Class Period

General Description
Students will use the process skills of observation, questioning, and measuring to determine the solute and solvent in a basic activity

Objectives
Students will use process skills to determine the solvent and solvent using every day candy

Arizona State Standards
SC08 S1C1 PO1 Formulate questions based on observations that lead to the development of a hypothesis.
SC08 S1C2 PO1 Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.

S1C2 PO4 Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers)
S1C2 PO5 Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs

S1C3 PO1 Analyze data obtained in a scientific investigation to identify trends

S1C4 PO1 Communicate the results of an investigation

W08 S3C3 Write a variety of functional text (e.g., directions, recipes, procedures, rubrics, labels, poster, graphs/tables)

Teacher Information
In solutions there are two parts; the solute and the solvent. The solute is the item that is usually in the smallest amount and is being dissolved by the solvent. A formal definition might be; a substance dissolved in another substance, usually the component in the lesser amount. A solvent is a substance, usually a liquid, capable of dissolving another substance. The students will also be manipulating the solution to increase the rate in which the solute dissolves.

Materials
Three beakers or clear plastic cups (per student group)
Water
Selection of candies, M&Ms, Skittles, Hard Candy, Life Savers (one type for each student group)
Two stop watches
Stirring rod
Small hammer
Plastic bag
Science journal
Activity Card 8-2

Procedures/Exploration

1. Give each student group three pieces of the same type of candy. For example: Group A will get three pieces of Life Savers.
2. Place one piece of candy in a beaker/plastic cup with room temperature water. Using one stop watch record how long it takes for the candy to dissolve completely. You will want to go on to the rest of the activity as this may take some time. Either use Activity Card 8-2 to record your data or use the science journal.
3. Taking another piece of the same candy put it in beaker/plastic cup with room temperature water. Using one stop watch record how long it takes for the candy to dissolve while another person is stirring. Either use Activity Card 8-2 to record your data or use the science journal.
4. Taking another piece of the same candy, place it in a plastic bag and crush it using the hammer. Be sure to put as much of the crushed candy into the beaker/plastic cup with room temperature water. Using one stop watch record how long it takes for the candy to dissolve while another person is stirring. Either use Activity Card 8-2 to record your data or use the science journal.
5. In each of the activities identify the solvent and the solute.
6. If using your journal, answer the following question there, otherwise answer on Activity Card 8-2
    a. Explain the results of your experiment by relating the dissolving rate to the method you used to dissolve the solution.
    b. Identify the solute and solvent in each of the following solutions.
        i. Ocean water- salt and water
        ii. Antifreeze- water and ethylene glycol
        iii. Soda- Syrup, water and CO_2
        iv. Gold jewelry- Gold and copper
        v. Kool aid- Powder, sugar, and water
        vi. Lemonade- Water, Lemon juice, sugar
    c. Which would have a higher amount of solute? A weak glass of lemonade or a strong glass of lemonade?
7. Have the students compare the different types of candies and the rates in which their dissolved. Have them explained why the rates were different.

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Student's Name: **Date:**

Use the table to record your data.

Piece of Candy	Dissolving Time

Answer the following questions

1. Explain the results of your experiment by relating the dissolving rate to the method you used to dissolve the solution.

2. Circle the solute and solvent in each of the following solutions.
   i. Ocean water- salt and water
   ii. Antifreeze- water and ethylene glycol
   iii. Soda- syrup, water and CO_2
   iv. Gold jewelry- gold and copper
   v. Kool aid- powder, sugar, and water
   vi. Lemonade- water, lemon juice, sugar

3. Which would have a higher amount of solute? A weak glass of lemonade or a strong glass of lemonade?

4. Have the students compare the different types of candies and the rates in which their dissolved. Have them explain why the rates were different.