Chemistry Cake **Primary Audience: 3rd – 5th Grade**

Description: Combine ingredients to make a tasty chemistry treat…aka pineapple cake.

Keywords: Chemical Change, Physical Change, Pineapple Cake

Concepts:

- A physical change is when a substance changes its form without affecting the substance itself.
- A chemical change is when one substance changes into an entirely different substance.
- A mixture is a combination of substances held together by physical means. Mixtures can be separated into their individual ingredients.

Materials:

- Equipment Per Group:
  - Large Mixing Bowl
  - Set of Measuring Spoons
  - Measuring Cup
  - Wooden Mixing Spoon
  - Cake Pan
  - Tray
  - Can Opener
  - Conventional, Convection, or Microwave Oven
  - Plates
  - Forks
  - Napkins
- Ingredients Per Group:
  - 1 Egg
  - ½ Teaspoon Vanilla
  - ½ 20-oz Can Crushed Pineapple
  - 1 Teaspoon Baking Soda
  - 1 Cup Flour
  - 1 Cup Sugar (omit ½ cup sugar if pineapple is sweetened)

Instructions:
Arrange the kitchen so that your family can work in as a team with a clean, flat work space where you can measure ingredients and mix them accordingly. Place all supplies and tools at one supply station. Assign family members one of the following tasks:

- Supply Specialist – gathers and returns all needed materials and tools
- Information Specialist – responsible for reading directions
- Clean Up Captain(s) – cleans all tools and containers

Introduce this activity by telling your family they are going to see chemistry in action as they make a cake. Explain that a chemical reaction happens when two or more substances combine forming a new substance. One of the ways we know a chemical reaction is happening is by observing a color change, bubbles forming, or a change in temperature of the substance. In this cake recipe, a chemical reaction will happen. Encourage members of the family need to watch the cake batter closely to see the reaction.

Before beginning, point out the location and arrangement of supplies at the supply station. Also, demonstrate proper measuring techniques for measuring solid substances. After your family feels familiar with their assignments, you may begin preparing the cake.

Step 1: Have your supply specialist retrieve the large mixing bowl and mixing spoon from the supply area.

Step 2: Retrieve 1 egg from your supply area (or refrigerator), crack, and pour into the large mixing bowl.

Step 3: Using the measuring utensils from your supply area, measure and mix the following items into your mixing bowl:

- ½ Teaspoon Vanilla
- 1 Teaspoon Baking Soda
- 1 Cup Flour
- 1 Cup Sugar (omit ½ cup sugar if pineapple is sweetened)

Step 4: Have your supply specialist acquire the can opener from the supply area, as well as, a 20-ounce can of crushed pineapples.

Step 5: Carefully open the can of pineapples and add ½ of the can to your mixture in the mixing bowl.

Step 6: Stir the contents of the mixing bowl until the mixture is dry ingredients are incorporated.

Step 7: Spray baking pan with cooking spray.

Step 8: Carefully pour cake batter into the pan.

Step 9: Bake in oven 25-30 minutes at 350 degrees (or in microwave 12-15 minutes).

While the cake is baking, discuss other recipes that might involve chemical reactions. Possible recipes include other acid and base reactions such as lemon juice, citric acid, or vinegar mixed with baking soda.

Step 10: Clean up all tools and return all unused supplies.

Step 11: Enjoy your creation.

Possible Interactive Questions:

- As additional ingredients are added, what do you observe?
- As the cake bakes, what is happening?
- Can you hypothesize what ingredients are causing the chemical reaction?

What's Going On?

In this cake recipe, a chemical reaction happens as your family mixes the ingredients. Specifically, the baking soda (a base) reacts with the pineapple juice (an acid) to release bubbles (carbon dioxide). As the cake bakes, these bubbles help the cake rise and have a spongy texture.