



Activity #5 - Bubbles Everywhere

In this activity you will observe a chemical reaction.

Background Information: Common kitchen ingredients such as baking soda and vinegar can produce very simple, yet interesting reactions. When vinegar (acid) and baking soda (base) are combined, they produce a harmless gas called carbon dioxide. A chemical reaction occurs when two or more substances combine and change into new substances. The indicators of a chemical reaction or the evidence that a chemical reaction occurred are change in temperature, color change, a gas given off, a new substance formed and/ or a precipitate form. A precipitate is a solid that forms from the mixture or solution. The activities below will visually show a chemical reaction and the production of a gas.

Part 1: Mix a Glass Full of Bubbles

Supplies Needed:

- Clear glass or jar (12 oz. or 16 oz., without a label)
- White vinegar (2 Tablespoons)
- Dish washing liquid (1 teaspoon)
- Baking soda (1 Tablespoon)
- Water (approximately 1 Cup)
- Measuring spoons
- Spoon
- Tray or plate
- Sponge or paper towels

What to Do:

1. Place the glass or jar on a plate or tray to catch spills if it overflows.
2. Pour 1 Cup water into a glass or jar.
3. Add 2 Tablespoons of white vinegar.
4. Stir in 1 teaspoon of dish washing liquid.
5. Stir in 1 Tablespoon of baking soda and watch what happens.

Discussion:

- Describe what happened.
- Why is the glass full of bubbles and overflowing?

Sum It Up: When the vinegar and baking soda were mixed together, a chemical reaction occurred and produced carbon dioxide gas which resulted in the glass filling up with tiny bubbles of soap.

Part 2: Dancing Raisins and Twisting Spaghetti

Supplies Needed:

- Clear glass or jar (12 oz. or 16 oz., without a label)
- Measuring spoons
- Water (3/4 Cup)
- Baking soda (1 teaspoon)
- White vinegar (3 Tablespoons)
- Raisins (2-3)
- Dry (uncooked) spaghetti (1 or 2 - 1/2 inch pieces)



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What to Do:

1. Pour 3/4 Cup warm water into a glass or jar.
2. Stir in 1 teaspoon of baking soda. Be sure to stir briskly until all of the baking soda is dissolved.
3. Drop in two to three raisins (or one to two 1/2 inch pieces of spaghetti). Use the smallest raisins you have.
4. Add 3 Tablespoons of white vinegar and watch what happens.

Discussion:

- Describe what happened. Why this is happening?
- What did the water look like when you added the baking soda?
- What happened when you added the vinegar?
- Do the raisins move up and down more than the spaghetti? Why or why not?

Sum It Up: When vinegar and baking soda are combined, a chemical reaction occurs and a gas called carbon dioxide is formed. The gas bubbles form under the raisins or spaghetti and lift them to the surface. The bubbles break and they fall to the bottom. The raisins or spaghetti will rise to the surface after more bubbles are formed around them. The raisins and/or spaghetti will continue to rise and fall as the bubbles form and break at the surface for about 15 minutes. The spaghetti moves up and down more because it is lighter and the number of gas bubbles that are needed to form under the spaghetti in order to make it move are less than the raisins.

Adapted from NJ 4-H Cloverbud Activity Guide, June 2013 (<https://njaes.rutgers.edu/pubs/publication.php?pid=4H270>)

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