At-Home History: Soda Bread

GRADES:
K – 12

DURATION:
15 - 30 minutes

LEARNING OBJECTIVES:
- Children will identify characteristics of chemical and physical changes.
- Children will recognize that baking soda and vinegar react to create carbon dioxide, a gas, which causes bread to rise.

MATERIALS:
For each child or group:
- 1 zip-top sandwich bag
- 1 paper towel
- Vinegar
- Baking soda

BACKGROUND INFORMATION:
For Children
Soda breads first appeared in American cookbooks in the late 18th century and early 19th century, using potash as a leavening agent.[1] They became even more popular in America after the development of commercial baking soda in 1846[2], and that popularity spread to Ireland, where the domestic flour used did not rise well with yeast.[3]

The earliest recipes use buttermilk. This slightly sour milk acts with the baking soda to create carbon dioxide, a gas, which causes the bread to "rise, or become light and fluffy. Any acidic ingredient will create this effect, and other recipes can use yogurt or even beer as the acidic ingredient. Because the rising reaction starts immediately and does not require the time that yeast does to start rising, these are called "quick breads".

You can observe this reaction at home. If you have ingredients, a quick bread is easy to make using flour, salt, baking soda, and buttermilk.[4] Or, you can get down to the bare basics and observe the creation of carbon dioxide gas using only two common ingredients: baking soda, and vinegar.

Sources
1. 'Early American gingerbread cakes' from Walbert's Compendium of Instruction and Entertainment, published February 3, 2010, accessed May 6, 2020 via Internet Archive.
2. 'Church & Dwight's Company History' from Church & Dwight Co., Inc., published 1999, accessed May 6, 2020 via Internet Archive.

3. 'Secrets of the soda bread masters' from BBC, published September 20, 2016, accessed May 6, 2020.
4. 'Traditional Irish Soda Bread' recipe from New York Times, accessed May 6, 2020.

ACTIVITY OUTLINE:

1. Talk to your child about the history of soda bread and how chemical reactions make bread rise, or have them read the background information on their own (refer to Background Information above). Let the child explore the topic further by using the sources provided or looking for more information independently.
2. Have your child read through the following activity steps before getting started.
    - Set up your experiment on a clean open space like a counter or table. This can get a bit messy, so this will make cleanup easier when you're done.
    - Tear off a piece of paper towel and lay it flat. Put one heaping spoonful (1-2 tablespoons) baking soda in the center of the paper towel.
    - Put about 1/4 to 1/3 cup vinegar into the plastic bag, leaving the top open. Set the back in a small bowl to keep it upright and the top open.
    - Fold your paper towel into a small burrito shape – this will keep the baking soda from reacting with the vinegar long enough for you to close the bag.
    - Drop the burrito into the bag, and zip the top tightly. **This needs to be quick, so you might want to practice with an empty paper towel and empty bag before you start!**
    - Stand back. The bag should start to inflate once the paper towel soaks through or opens ip. It may or may not pop, depending on how strong your bag is, so you might end up with a balloon!
3. Proceed with the activity, allowing your child to be the lead scientist. After it's over, ask them what they observed and discuss why they think this reaction is a critical step for making bread, and how they think the people of the past figured this out. Don't forget to have them help clean up, because every good scientist keeps a neat and organized lab!

ADAPTATION FOR EACH GRADE:

- K-5 children will need additional help with this project.
- All children might find it interesting to make an Irish Soda Bread (check the footnotes above for a few recipes) with you after learning more about the chemical reactions!

ONE MORE THING:

Let us know how it went! Tag us on social media or email us at education@ohiohistory.org.