

Chemical Changes and Biscuits

4th Grade

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References:

- Food Network show “Good Eats,” episode “The Dough also Rises”
- Southern biscuit recipe from that episode:
http://www.foodnetwork.com/food/recipes/recipe/0,,FOOD_9936_151,00.html
- Kitchen Science Explained: What Einstein Told His Cook by Robert L. Wolke

Benchmarks:

SLC/GLI #: PS2

Objectives:

The objective of this lesson is to teach chemical changes in everyday life settings, such as cooking. Leavening is one of the classic chemical changes that most people experience, yet few actually understand it. This lesson will explain leavening in biscuits with the chemical change taking place through baking soda, baking powder and an acid: buttermilk.

Materials:

- biscuit recipe, I used a recipe from the Food Network show, “Good Eats”
- “Good Eats” episode, “The Dough also Rises”
- baking utensils necessary for making biscuits, including school oven.
- Baking soda and vinegar for demonstration

Initial Demonstration:

The initial demonstration should be combining vinegar and baking soda to produce the “volcano” effect. At this level, I’m not sure if the students know anything about chemical and physical changes, and because of time constraints and that we wanted to do this fun lesson before Thanksgiving break, they won’t have actually had a formal introduction to what chemical changes are, but this will be a good example when we go into them in depth later. With the demonstration, you should describe the reaction that’s happening with the acid mixing with the baking soda, which is sodium bicarbonate, and the chemicals combine to make a chemical reaction, forming carbon dioxide, which is what make the biscuits rise.

Target Observations:

- Students should notice that millions of bubbles are formed when you mix baking soda and vinegar.

- This is a chemical change taking place, where two materials combine and form a third material, which is different and unique from the first two.
- Students should also understand that it's the product of this type of reaction that creates leavening in breads and makes them rise.

Procedure:

To conduct the rest of this lesson, simply follow the recipe for making biscuits. Be sure to point out which ingredients react with the baking soda/powder to create leavening. In my recipe, it would be the buttermilk. Also, be sure to comment on good hygiene practices in the kitchen, especially with the recipe I'm using, because the students will use their hands to mix the dough.

Target Observations:

- Students should notice that in making the biscuits, they mixed together the ingredients necessary to make a chemical change in those ingredients that results in the leavening of the dough once it gets to the oven.

Target Revised Model:

- Chemical changes happen all the time in cooking. One of these changes is necessary for bread dough to rise.
- This leavening chemical reaction can be achieved by mixing baking soda with an acid, such as chocolate, eggs, buttermilk, or sour cream, or it can also be achieved by using baking powder and any other liquid.

Summary:

In this lesson, students were able to have fun making biscuits, while learning how chemical changes happen in many every day activities, such as cooking. This lesson exploited the chemical change which takes place through the leavening of bread, using baking soda, baking powder and an acid that is also in the recipe; in this case, the acid present was buttermilk.