



Baking Powder, Double Action!

Supplies:

- Baking Powder
- Water
- A small microwavable cup or bowl
- Measuring cup
- Measuring spoon
- Hot pads
- A microwave (and your parent's permission to use it)

Age or Grade: All Ages

Time: 15 Minutes



Background:

Double acting baking powders react twice, once when added to water and then again when heated. A double acting baking powder is a mixture of phosphates (usually monocalcium phosphate, which reacts at room temperature when moistened, and sodium aluminum sulfate, which reacts to heat) and baking soda. A balanced double acting baking powder forms many small bubbles in the batter when mixing, allowing the product to remain stable if it stands before baking. The next release of carbon dioxide gas occurs during baking, resulting in finer cell structure and proper volume of the final product.

Project Goal:

Discover how a chemical reaction can cause batter to rise in two stages using baking powder.

What to Do:

1. Use a small clear glass bowl or cup that is microwaveable to best see this reaction.
2. Add 1 tsp of baking powder to a 1/2 cup of room temperature water and stir. Watch the reaction.
3. Wait until the reaction stops (about 3-5 minutes)
4. Now microwave the cup of baking powder and water for approximately 1 minute on high.
5. Open the Microwave Be careful. It will be very hot!
6. What happened? Was there a second reaction?
7. Wait until the liquid cools or use hot pads to remove the cup from the microwave and dump the water a baking powder in the sink.



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Virginia 4-H STEM @ Home Activity

- Reflect:**
1. What is the advantage of using a chemical reaction to cause your batter to rise in two stages – once during mixing and then again during baking?
 2. What happens during this process?

- Apply:**
1. What items do you use baking powder in?
 2. What does it do? Why is it important?

Going Further: Further Investigations: Try making homemade baking mix to bake some muffins or breads with your family. This “Master Mix” uses baking powder and a few basic ingredients and can be used to create a variety of muffins and breads! Go to <https://www.ag.ndsu.edu/publications/food-nutrition/making-magic-mixes-baking-master-mix#section-0>

Notes for Parents or Helpers: *Discover more about how baking powder revolutionized the way we bake by going to <https://www.smithsonianmag.com/science-nature/great-uprising-how-powder-revolutionized-baking-180963772/>.*



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