5th Grade - Lesson 3.1 **Name: _____**

Activity Sheet

What's the Difference between Baking Soda and Baking Powder? **Date: _____**

Safety: Wear safety goggles and be sure to follow all safety instructions given by your teacher. Wash your hands after completing the activity.

INTRODUCTION

1. If you want to test whether baking soda or baking powder produces more gas when vinegar is added, should you use the same amount of baking soda and baking powder in your test? Explain.
   If you want to compare how baking soda and baking powder react with vinegar, you should use the same amount of each powder. Using more or less of one than the other might affect the test and not allow you to make a true or fair comparison.

2. In the test described above, should you use the same amount of vinegar? Explain.
   You should use the same amount of vinegar. Since you are comparing how baking soda and baking powder react with vinegar, the amount of vinegar should be kept the same for both. The amount of vinegar used might affect how they react so if you used more or less vinegar with one than the other, it wouldn't be a fair comparison.

ACTIVITY

Question to investigate:

Does baking powder or baking soda produce more gas when vinegar is added?

Materials

- Vinegar in cup
- 2 small clear plastic cups labeled vinegar
- Baking soda in cup
- 1 small plastic cup labeled Baking soda
- Baking powder in cup
- 1 small plastic cup labeled Baking powder
- Detergent solution in cup
- Graduated cylinder or teaspoon
- ½ teaspoon
- Dropper

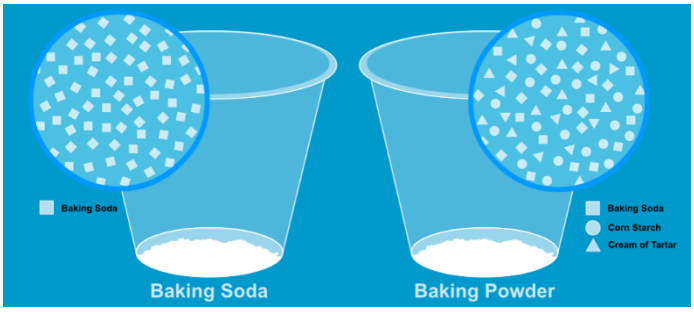
Procedure

1. Place 10 milliliters (2 teaspoons) of vinegar into each of the two small cups labeled “Vinegar”.
2. Use your dropper to add 1 drop of detergent solution to the vinegar in each cup.
3. Measure ½ teaspoon of baking soda and place it in the cup labeled “Baking Soda”.
4. Measure ½ teaspoon of baking powder and place it in the cup labeled “Baking Powder”.
5. At the same time, pour the vinegar into the baking soda and baking powder and see how they react.

3. When you added the vinegar to the baking soda and baking powder, what did you observe?
   The baking soda had a stronger reaction with the vinegar than the baking powder did. The baking soda and vinegar made more bubbles and made them faster.

4. Do your results from the experiment make you think that baking soda and baking powder are the same or different? Why?
   Baking soda and baking powder are different because they reacted differently with the vinegar.

EXPLAIN IT WITH ATOMS & MOLECULES



5. You saw an animation showing that baking powder is actually made up of baking soda and two other ingredients. How does this help explain why baking powder doesn’t produce as much gas as baking soda when vinegar is added?

If the vinegar is reacting with the baking soda, then it makes sense that the reaction with pure baking soda is stronger than the reaction with less baking soda mixed with other ingredients.

TAKE IT FURTHER

Your teacher did a demonstration or showed a video using the same amount of vinegar in two bottles. Attached to the bottles were balloons with the same amount of baking soda and baking powder in each.

6. Was it important that the balloons were the same type and size? Why?

   If you are using balloons to see whether baking soda or baking powder has a stronger reaction with vinegar and makes more gas, then you have to use the same type of balloon on both samples. Since you will judge how much gas was made based on the amount the balloons inflate, the balloons should start out the same. If the balloons were different, it could affect how easy or hard they are to inflate and the comparison would not be fair.

7. Did the results of the demonstration agree with what you saw in the test that you did baking soda and baking powder?

   Yes. The baking soda and vinegar inflated the balloon more than the baking powder and vinegar. That means that the baking soda and vinegar produced more gas like we saw before.