Bubble Bomb
Using baking soda and vinegar, you can pop a plastic bag with the power of fizz.

What do I need?

- water
- measuring cup
- zipper-lock plastic sandwich bags
- paper towel
- tablespoon
- baking soda
- vinegar
What do I do?

1. Figure out where you want to explode your Bubble Bomb. Sometimes the bags make a mess when they pop, so you may want to experiment outside. If it's a rainy day, you can explode your Bubble Bombs in the bathtub or sink.

2. It's very important to use a bag without holes. To test the zipper-lock bag, put about half a cup of water into it. Zip it closed and turn it upside down. If no water leaks out, you can use that bag. Unzip it and pour out the water. If the bag leaks, try another one. Keep testing bags until you find one that doesn't leak.

3. Tear a paper towel into a square that measures about 5 inches by 5 inches. Put 1 1/2 tablespoons of baking soda in the center of the square, then fold the square as shown in the picture, with the baking soda inside. This is your "time-release packet."

4. Pour into your plastic bag:
   - 1/2 cup of vinegar
   - 1/4 cup of warm water
Now here's the tricky part. You need to drop the time-release packet into the vinegar and zip the bag closed before the fizzing gets out of control.

You can zip the bag halfway closed, then stuff the packet in and zip the bag closed the rest of the way in a hurry. Or you can put the time-release packet into the mouth of the bag and hold it up out of the vinegar by pinching the sides of the bag. Zip the bag closed and then let the packet drop into the vinegar.

One way or another, get the packet in the vinegar and zip the bag closed.

Shake the bag a little, put it in the sink or on the ground, and stand back! The bag will puff up dramatically and pop with a bang.
Why does the Bubble Bomb explode?

The bubbles in the Bubble Bomb are filled with carbon dioxide, a gas that forms when the vinegar (an acid) reacts with the baking soda (a base).

If you've ever made a cake or baked a loaf of quick bread (the kind that doesn't use yeast), you've already done some experimenting with the bubbles that come from an acid-base reaction. Most cakes and quick breads rise because of bubbles in their batter. Those bubbles, like the ones in your Bubble Bomb, are created by the chemical reaction of an acid and a base.

Take a look at a recipe for quick bread. If the recipe includes baking soda but no baking powder, it will probably also include an ingredient that's acidic—such as buttermilk, sour milk, or orange juice.

Quick-bread recipes may call for baking powder in addition to or instead of baking soda. Baking powder is made by combining baking soda with an acidic ingredient, such as tartaric acid or calcium acid phosphate. When you add water to baking powder, it will fizz as the acid and base interact. In fact, if you ever run out of baking powder, you can make your own by mixing two teaspoons cream of tartar (it provides the acid), one teaspoon of baking soda (it's the base), and a half-teaspoon of salt.

Some Other Things to Try

- Try using a different size of zipper-lock plastic bag. What do you think might happen? Do you think you'll need to use more baking soda, vinegar, and water to make the bag explode? Try it and see.
- In the original experiment, we asked you to use warm water. Try using cold water or hot water. Does changing the temperature change your results? How?
- The first time you tried this, you mixed the vinegar with water. Try doing the experiment again with just vinegar. How did this change your experiment?
- Instead of using paper towel, make your "time release packet" using a different kind of paper, like toilet paper, tissue paper or notebook paper. What happened?

**Baking with Bubbles**

Any baked goods that rise rely on carbon dioxide bubbles to get the job done. You can make these bubbles either by using yeast or by using the acid-base reaction like you did in the experiment.

Yeast is a one-celled fungus which converts sugar to carbon dioxide gas. Because this process takes a while, bakers use yeast in doughs that they leave alone for several hours.

Another method that cooks use to make something rise is a combination of baking soda and an acidic ingredient, like orange juice or buttermilk. This is the same kind of chemical reaction that took place in your bubble bomb.

Next time someone you know is baking, check the recipe to see if you can figure out what ingredients make the bubbles that make the cake or bread or cookies rise.