

# Rocket Reactions



## Get ready

Put on your safety goggles!

## Set-up the experiment

Use the labeled teaspoons to add one scoop of *citric acid* and one scoop of *baking soda* to your mini-rocket tube.

## Make a prediction and test it

What will happen when you add water to the ingredients?

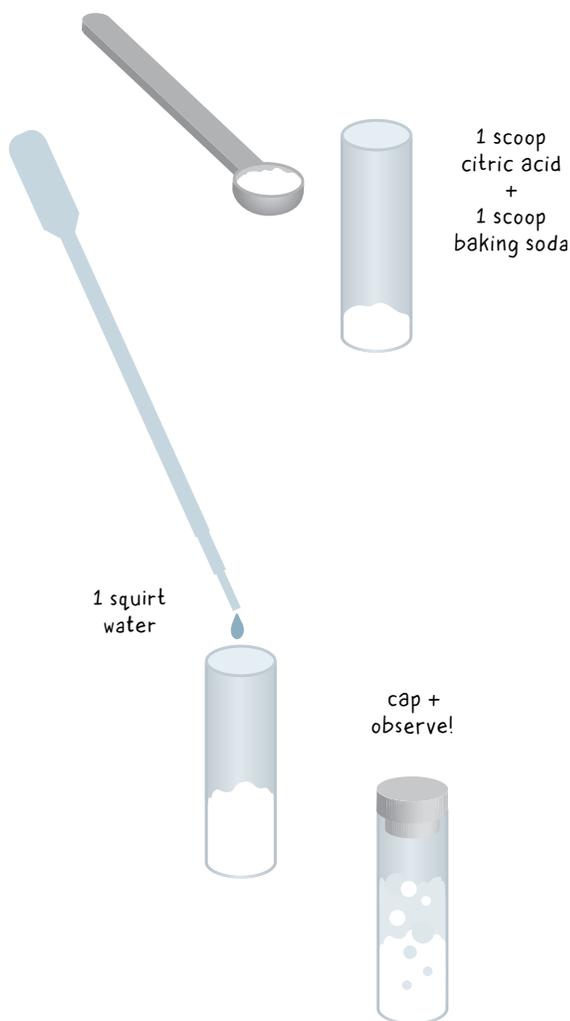
Use a pipette to add 5 drops of water to your tube, count to three, then firmly push the cap onto your tube.

## Observe the reaction

What happens? Try pushing the cap onto the tube again. What do you notice?

## Try again

Cap the tube again and again until you no longer notice a reaction. How many times were you able to launch the rocket?



**Let's keep experimenting!** Try making the rocket again with different amounts of water, citric acid, and baking soda. What changes? What mixture works best?

# An important part of the process of chemistry is to experiment and try different things over and over.

In this activity, you experimented with a chemical reaction. In the presence of water, citric acid and sodium bicarbonate (also called baking soda) react to form sodium citrate, water, and carbon dioxide gas. The carbon dioxide gas is what pops the top off the tube—launching your mini-rocket!



**Chemists, like this undergraduate student, experiment by asking questions and testing predictions.**

Chemists and other scientists use the *scientific process* to learn about the world around them. In this process, scientists make careful observations, ask questions, make predictions, test their ideas, make more observations, and then they repeat the cycle. Not every experiment is a success, but scientists can learn from mistakes too.

## Chemists study how different materials behave and change, and how materials interact with each other.

You may recognize our mini-rocket fuel materials as things that you use in your own homes. Baking soda is a common ingredient in many baked goods because of how it reacts to other ingredients. When it is combined with ingredients that are very acidic, such as buttermilk, a chemical reaction similar to what happens in our rockets creates carbon dioxide bubbles that help make baked goods light and fluffy. Think of your kitchen as a kind of laboratory. In our kitchens, we use many chemical reactions to change ingredients in different, and sometimes delicious, ways.



**Baked goods like Irish soda bread often rely on the chemical reaction between baking soda and buttermilk (or another acid) to rise.**

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*Like to bake and cook in the kitchen? You're doing chemistry!*