

# Kitchen Chemistry:



## Demonstrations and Experiments



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## What is chemistry?

### Chemistry



Chemistry is all about studying **matter** (*anything that has mass and takes up space*) and how it changes; what substances are made of, their properties, how they act, and how they interact.

When particles of matter come in contact with one another, the particles might not have any effect on one another, or one or both sets of particles might experience a change. The study of these particles and their interactions is what chemistry is all about.



A **chemical reaction** happens when two or more molecules **interact** and something happens. A **chemical change** must occur. You start with one compound and turn it into another. That's an example of a chemical change. A steel garbage can rusting is a chemical reaction. That rusting happens because the iron (Fe) in the metal combines with oxygen (O<sub>2</sub>) in the atmosphere.

## Why study chemistry?

Learning chemistry is key to understanding the world around you. It can also lead to an exciting career. From agriculture to zoology, chemistry is everywhere and touches our lives in countless ways.

Chemistry can be interesting and fun, too. Understanding chemicals will be important to you throughout your life. You will need to make decisions about what medications to take, or laws that affect your environment. Understanding chemistry can help you make good choices.

## What is a chemist?

Most chemists work in laboratories. Chemists make new materials and discover ways to use materials for new purposes. Chemists help make everyday products, they help look for cures, improve our food, air, and water.



## What do chemists do?

With a career in chemistry you can work in many different areas: the environment, manufacturing, medicine, transportation, teaching, law

enforcement, and many other fields. Work activities for the chemist can vary from collecting field samples to writing for a technical journal. Not only are there specialties to the large field of chemistry, there are numerous career paths you could choose. Some are 100% chemistry while others use chemistry every day but focus on other work. Here are some examples:

## DOCTOR

Doctors have to know a lot about biochemistry and the chemical reactions going on in your body. Not only how they work normally but what happens when they go wrong. They also have to understand how drugs affect your body's systems.



## PHARMACIST, PHARMACOLOGIST

These are the people at the drug store who fill your prescriptions. There are also the people who study pharmacology in school and learn how to create new drugs to cure diseases. Someone with a Pharmacology degree might work in a lab all day studying and creating new compounds. There are then several years of testing to see how the compounds interact with the human body.



## UNIVERSITY RESEARCHER

These are the folks who spend their whole careers working at a university focusing on one or two specific ideas in chemistry. They may also be teachers of chemistry classes. They can work in any part of chemistry, not just the world of chemistry in living things (like the above examples). They often spend many years in school getting their degree before they begin their own research.



## FORENSICS EXPERT

These scientists work with law enforcement officials. They go to scenes of the crime, gather clues, bring them back to their labs and analyze them. An example might be a murder scene where someone tracked mud all over the carpet. The forensics expert could come and take a sample of the mud, analyze the elements and then compare it to a database of mud around the city. That might help the police figure out where the mud came from and lead them to the killer.



# Alka Seltzer Rockets

Make a rocket you can launch!



## Materials:

- 1/4 of an Alka Seltzer tablet
- 1 Fuji film canister - the kind where the lid fits inside the canister. The others don't work!
- Warm water
- **Be sure to do this experiment outside and with adult supervision!**

## Instructions:

1. Fill the film canister 1/2 full with warm water.
2. Drop in 1/4 tablet of Alka Seltzer - no more.
3. Snap the lid tightly into the canister, turn it over on a hard surface, and stand back! The sodium bicarbonate will make the canister launch into the air. If you vary the temperature of the water, your rocket will shoot to different heights. The warmer the water, the higher it will go.
4. If you want to make a rocket launch pad, cut three slits about 1 inch high in the bottom of a toilet paper tube. Bend the slits so you can tape them to a paper plate. You might want to decorate your plate and tube first.
5. When you are ready to launch your rocket, drop the prepared film canister into the toilet paper tube and stand back!

Gas pressure builds inside the film canister due to the mixing of Alka-Seltzer and water and the gas applies a force to both the canister and the lid. Eventually, enough pressure builds to blow apart the canister and lid; the canister and lid/gas/water are pushed apart in opposite directions.

There are also some rocket patterns on the Internet you can print out:

[http://www.sci-experiments.com/seltzer\\_rocket/seltzer.html](http://www.sci-experiments.com/seltzer_rocket/seltzer.html)

<http://www.scouts.ie/beavers/programme-ideas/seltzer-tablet-rocket/>

You can also watch a [video](#).