



## Try This at Home Science: Alka-Seltzer Rockets

### Activity Overview:

Build and launch a rocket by creating an acid-base chemical reaction inside a film canister.

### Materials:

- Empty film canister
- Alka-Seltzer tablets
- Water
- Plastic tray or other plastic container
- Safety goggles

### Try this!

1. Open the empty film canister and place it on plastic tray (if you do not have a tray or container, try this activity outside for faster clean up).
2. Fill the film canister about half-way with water.
3. Break one Alka-Seltzer tablet in half and set to the side.
4. Put on your safety goggles! Remember, you'll be launching a rocket in this experiment.
5. Drop one piece of Alka-Seltzer into the film canister, then quickly seal the lid and flip the film canister over on the tray.
6. Stand back and watch what happens as the pressure builds inside the container.

### What's happening?

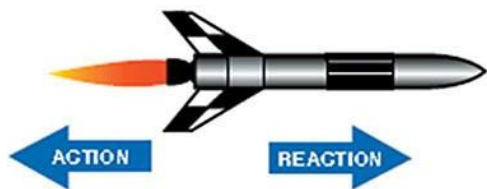
Alka-Seltzer contains both an acid and a base in its solid form – citric acid (found in citrus fruits) and sodium bicarbonate (baking soda). When the tablet is dissolved in water, the acid and base are allowed to mix together which generates a lot of carbon dioxide gas.



Since gases take up more space than their solid and liquid counterparts, trapping this reaction in a sealed container will cause pressure to build inside the film canister. As the molecules expand, pressure continues to build until the top is blown off and propelling the canister into the air.

### How does this relate to rocket science?

According to Newton's Laws, for every action there is an equal and opposite reaction. When the lid is blown off the film canister, it exerts a powerful downward force onto the tray. The resulting reaction is a force that pushes the rest of the canister into the air.



When used to describe rockets, we call this force thrust and it is used to overcome the weight and air resistance of a rocket when it is sent into space from Earth. The greater the weight and size of the rocket, the more thrust is needed to overcome these downward forces.

### Now try...

- Experiment using different temperatures of water in the rocket. Does the speed of the reaction increase or decrease with water temperature?
- Add fins and a nose cone to your rocket using scrap paper and tape. Can you stabilize the flight of your rocket by adding these parts?
- Look around for other containers with snap-on lids. Can you launch a different type of Alka-Seltzer rocket?

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