



ALKA SELTZER ROCKETS

MATERIALS:

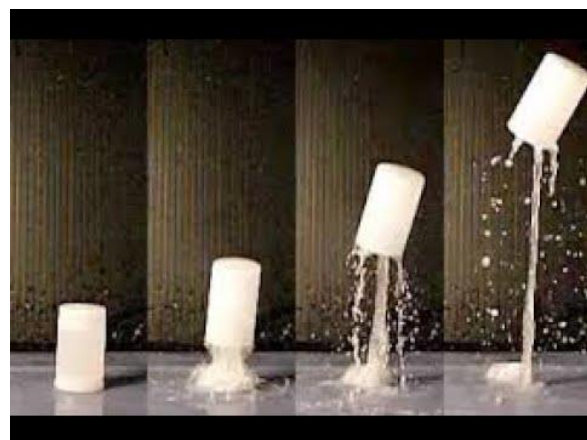
Film Canisters	Alka Seltzer
Water	Food Coloring
Safety Goggles	Paper Towels

VOCABULARY:

Rocket	Physics	Chemistry
Matter	Solid	Liquid
Gas	Pressure	Newton's Laws
Inertia	Force	Acceleration
Mass	Gravity	Thrust

DIRECTIONS:

1. Safety first! Put on your safety goggles!
2. This is an outdoor experiment! Set up a table or launch the rockets right off the ground- but only do this outside!
3. Add food coloring to a cup of water and mix.
4. Fill each of the five film canisters about $\frac{1}{4}$ full of the colored water.
5. Break up an Alka Seltzer tablet into small pieces.
6. Add a piece of Alka Seltzer to each film canister and quickly add the cap- make sure you hear it click!
7. Flip each canister over as you close it so they are all upside down on your launch surface.
8. Stand back and watch!



THE STEAM BEHIND THE EXPERIMENT:

As the antacid tablet fizzes, carbon dioxide is released inside the canister.

Pressure from the gas builds and eventually pops the lid off. The thrust, or push, of your rocket is related to how much pressure built up inside the canister before the top popped off. This activity demonstrates Newton's Three Laws of Motion:

1. An object at rest will stay at rest, and an object in motion will stay in motion, until an unbalanced force acts upon it. (For this experiment, the rocket is not going to move by itself. We have to apply a force. In this case, we use pressure from carbon dioxide gas build up inside the rocket. The rocket does not stay in motion forever because of gravity and drag from air molecules).
2. Force = Mass x Acceleration. (For this experiment, the rocket does not have a lot of mass, so it does not take lot of force to move it. The more pressure that builds up, the more force is applied, and the higher or further the rocket will fly).
3. For every action, there is an equal and opposite reaction. (For this experiment, we flip the bottle upside down. When the pressure makes it pop, it pushes down, which makes the rocket go up!).

BASEBALL CONNECTION:

Just like the Alka Seltzer Rockets, Newton's Laws can be used to explain how baseballs move! Baseballs are not going to move by themselves- a force has to be applied! This can happen when the ball is thrown, hit, dropped, etc.

Newton's Three Laws of Motion:

1. An object at rest will stay at rest, and an object in motion will stay in motion, until an unbalanced force acts upon it. (In baseball, the ball is not going to move by itself. We have to apply a force. With baseball, the ball must be thrown, hit, dropped, etc. The ball does not stay in motion forever because of gravity and drag from air molecules).
2. Force = Mass x Acceleration. (In baseball, the ball does not have a lot of mass, so it does not take lot of force to move it. The faster the pitcher throws it or the harder a batter hits it, the more force is applied, and the higher or further the ball will fly).
3. For every action, there is an equal and opposite reaction.

MAKE IT AWESOME:

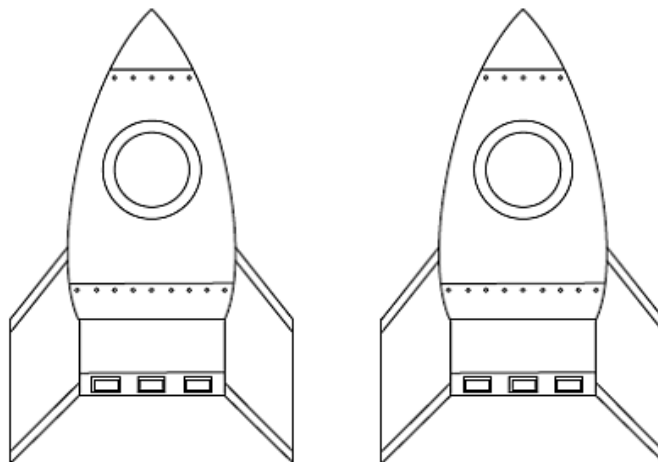
Use paper and tape to make fins and a nose cone for your rocket! You can also decorate a small cup to look like a rocket and place it over the film canister to see what happens.

EXTENSIONS:

1. What happens when you change the amount of water or Alka Seltzer used?
2. What happens if you use warmer or colder water?
3. What other changes can you come up with for this experiment?

VIDEOS AND WEBSITE LINKS:

1. Alka Seltzer Official Website and Directions: <https://www.alkaseltzer.com/original/science-experiments/rockets>
2. King of Random Alka Seltzer Rocket Video: <https://youtu.be/os0my8Y5qmA>
3. Soda Bottle Alka Seltzer Rockets: <https://thehomeschoolscientist.com/how-to-make-a-rocket-with-alka-seltzer/>
4. Easter Egg Rocket: <https://team-cartwright.com/easter-egg-rocket/>



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