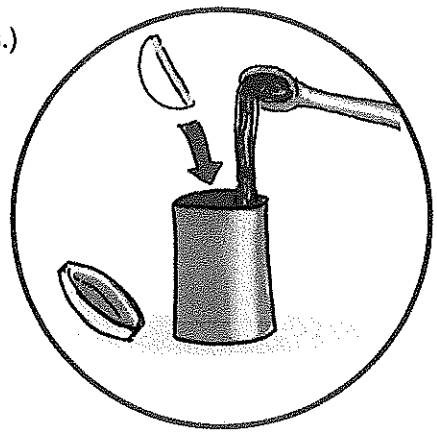
BUILD A FILM CANISTER ROCKET!

YOU WILL NEED:

- One empty 35mm plastic film canister and lid. These are getting harder to find,
- but stores that develop film should have some. (The white canisters work much
- better than the black ones do.)
- One fizzing antacid tablet (such as Alka-Seltzer - Get this from your parents.)
- Water
- Safety goggles



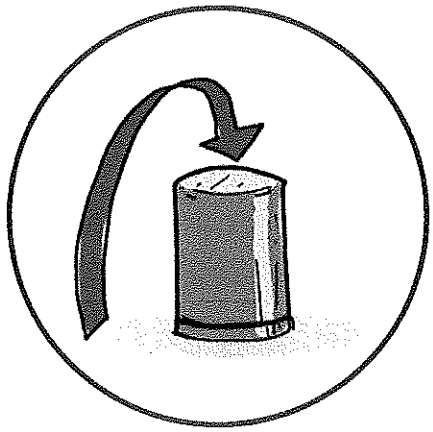
WHAT TO DO

1. Put on those safety goggles and head outside - no really, when this works, that film canister really flies! If you want to try the indoor version, do not turn the canister upside down in step 5.

2. Break the antacid tablet in half.

3. Remove the lid from the film canister and put a teaspoon (5 ml) of water into the canister. Do the next 2 steps quickly.

4. Drop the tablet half into the canister and snap the cap onto the canister. (make sure that it snaps on tightly.)

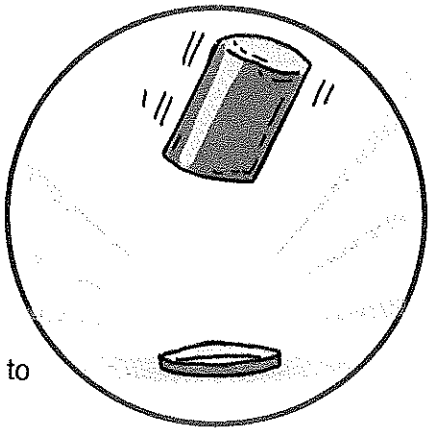


5. Quickly put the canister on the ground CAP SIDE DOWN and STEP BACK at least 2 meters.

6. About 10 seconds later, you will hear a POP! and the film canister will launch into the air!
CAUTION: If it does not launch, wait at least 30 seconds before examining the canister. Usually the cap is not on tight enough and the build up of gas leaked out.

HOW DOES IT WORK?

There's nothing like a little rocket science to add some excitement to the day. When you add the water it starts to dissolve the alka-seltzer tablet. This creates a gas called carbon dioxide. As the carbon dioxide is being released, it creates pressure inside the film canister. The more gas that is made, the more pressure builds up until the cap it blasted down and the rocket is blasted up. This system of thrust is how a real rocket works whether it is in outer space or here in the earth's atmosphere. Of course, real rockets use rocket fuel. You can experiment controlling the rocket's path by adding fins and a nose cone that you can make out of paper. If you like this experiment, try the Exploding Lunch Bag. Be safe and have fun!



MAKE IT AN EXPERIMENT:

The above is a DEMONSTRATION. To make it a true experiment, you can try to answer these questions:

1. Does water temperature affect how fast the rocket launches?

2. Does the size of the tablet piece affect how long it takes for the rocket to launch?

3. Can the flight path be controlled by adding fins or a nosecone to the canister?

4. How much water in the canister will give the highest flight?

5. How much water will give the quickest launch?

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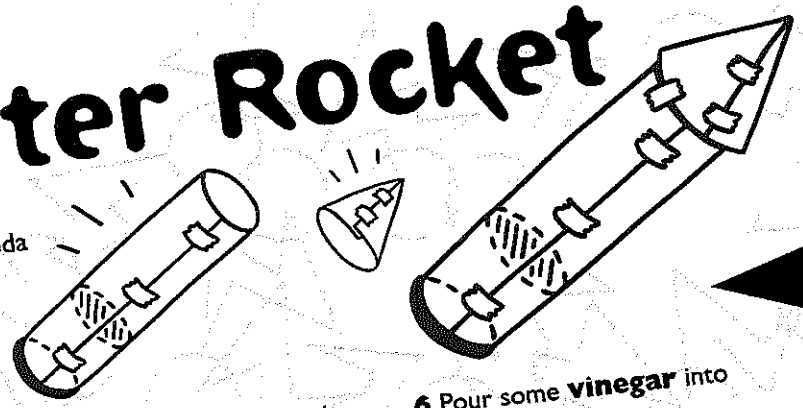
Film Canister Rocket



What You Need: • empty film canister with lid • construction paper • tape • scissors • baking soda • vinegar • some toilet paper • spoon

Try It Out!

1 **Roll** a piece of paper around the film canister once so that it makes a long tube.

2 Make sure that the **cover** of the film canister **sticks out** of one end of the tube. **Tape** the paper in place.

3 **Make a nose** cone by cutting a circle out of paper.

4 **Cut** a line from the edge of the circle to the middle of the circle, and **twist** the paper into a cone shape.

5 **Tape** the cone together. Then tape it on the **open end** of the paper tube.

6 Pour some **vinegar** into the film canister.

7 Put some **baking soda** in the center of two squares of toilet paper. **Fold** the toilet paper to make a "**fuel packet**."

8 **Place** the fuel packet in the canister and **put** the cover on quickly.

9 **Set** the rocket down so that the nose cone points up, and stand back. **Blast-off!**

Science Scoop

When you mix baking soda and vinegar, a **chemical reaction** happens. In a chemical reaction, the molecules you mix **break up** into atoms, and these atoms **recombine** to form new molecules. In this activity, the atoms in the baking soda molecules and the atoms in the vinegar molecules recombine to make **carbon dioxide gas molecules**. (Carbon dioxide gas, CO_2, is the same gas you **exhale**.) As the chemical reaction continues, **more** carbon dioxide gas is produced. This makes the **pressure** inside the film canister greater. Eventually the pressure is so great that the top **pops off** of the film canister, and the rocket is **launched!**

CAUTION:
Be careful when launching your rocket. Stand back and don't point it at anyone.

Sent in by Megan S. and Lee M. of College Station, AR

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Think about one thing you can change about the rocket. What happens if you use different amounts of **baking soda**? How about if you launch a rocket without a **nose cone**? What if you don't use **toilet paper**? Choose **one thing** to change (that's the variable). Then **predict** what you think will happen and **test** it. Send your results to ZOOM.

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