

DIY STEM

THE SCIENCE OF EVERY DAY



Build and launch a bubble rocket

MATERIALS NEEDED:

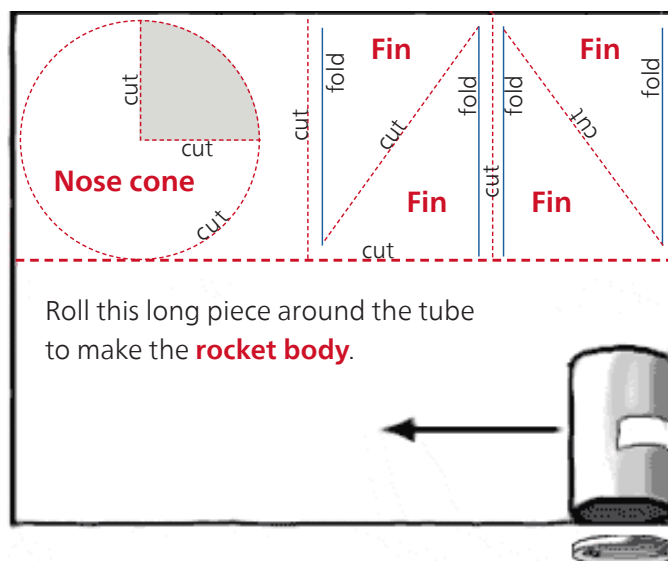
- Film canister tube and cap
- Effervescent antacid tablets
- Colorful construction paper
- Foil
- Tape
- Glass of water
- Eye protection
- Decorations (stickers, washi tape, painters tape)

Making the rocket

You must first decide how to cut your paper. You may cut it the short way or the long way to make the body of the rocket. There is no one right way to make a paper rocket. Try a long, skinny rocket or a short, fat rocket. Try a sharp nose cone or a blunt nose cone. Try it with fins or without fins. Experiment!

Here's just one idea for how you might cut your whole rocket from one piece of paper:

For the nose cone, use a jar lid or something like that to trace the shape.



Try this with an adult!

Tape tube to edge of paper before you start rolling paper around tube.

Build and launch a bubble rocket

Basic steps

1. Cut out all the pieces for your rocket.
2. Important! Place the lid end of the tube down.
3. Tape fins to your rocket body, if you want.
4. Roll the circle (with a wedge cut out) into a cone and tape it to the rocket's top.

Blasting off

1. Put on your eye protection!
2. Tightly wrap a piece of foil (1"x1") around one half of antacid tablet.
3. Turn the rocket upside down and remove the tube's lid.
4. Fill the plastic tube one-third full of water.

Now work quickly on the next steps!

1. Drop the foil-wrapped effervescing antacid tablet into the canister.
2. Tape the lid on tight.
3. Stand your rocket on a launch platform, such as your sidewalk or driveway.
4. Stand back and wait. Your rocket will blast off!

You can view this activity here: <https://youtu.be/h6pb3NVPVUE>

HOW DOES IT WORK?

When the fizzy tablet is placed in water, many little bubbles of gas escape. The bubbles go up, instead of down, because they weigh less than water. When the bubbles get to the surface of the water, they break open. All the gas that has escaped from the bubbles pushes on the sides of the tube.

For example, when you blow up a balloon, the air makes the balloon stretch bigger and bigger. But the tube doesn't stretch and all this gas has to go somewhere!

Eventually, something has to give! So the tube pops its top (which is really its bottom, since it's upside down). All the water and gas rush down and out, pushing the tube up and up, along with the rocket attached to it.

We call this wonderful and useful fact the law of action and reaction. The action is the gas rushing out of the rocket. The reaction is the rocket taking off in the other direction. In other words, for every action there is an equal and opposite reaction. The rocket goes in the opposite direction from the gas, and the faster the gas leaves the rocket, the faster the rocket rises.

Activity modified from published content from NASA: <https://spaceplace.nasa.gov/pop-rocket/en/> and Playdough to Plato: <https://www.playdoughtoplato.com/kids-science-exploding-pop-rockets/>