



Transcript: Build and Launch a Foam Rocket

Here's another great fun and educational activity you can do in class or outside of school: Foam Rockets. It uses some inexpensive, readily available materials.

You will need a piece of foam pipe insulation -- about a half inch interior diameter -- a pair of scissors, three zip ties, a small amount of string, one of these fat rubber bands and some sort of stiff materials to make your fins to keep the rocket stable -- Styrofoam, cardboard or even a little card stock.

For the math portion of the activity, you're going to need a meter stick and you're going to need to make one of these elevation gauges. This will tell you what angle you're launching your rocket at. The plans for this are included in the [PDF of the activity](#).

To get started, measure out about a 30 centimeter length and then just give it a cut. You'll notice there is a pre-scored cut along one edge. It runs the full length of that pipe insulation. Cut along that about eight centimeters. Make three additional cuts at a spacing of 90 degrees around the circumference. You'll end up with this nice flared bottom of your rocket.

Take a piece of string about 70 centimeters in length, and you're going to tie a loop. And I suggest you give it a really good yank because this is going to be a crucial part of the operations of the rocket.

Attach that string to your rubber band. Take one of your zip ties and run it between the two of these and zip it up tight and then trim off the extra. This zip tie here is going to keep the insides of the rocket from pulling out.

Drop the string from the top down toward the flared end. Now remember that zip tie is inside the rocket.

Now attach a zip tie to the nose of the rocket in front of the other zip tie. Wrap it around the nose. Before I tighten it all the way down, I'm going to make sure that I've pulled the string down a good ways so that the rubber band is barely sticking out so that I'm sure the zip tie that I used before is in here somewhere. And then I'm going to pull this really, really ridiculously tight. Trim off the extra. The reason you want that ridiculously tight is so that this rubber band will not pull out.

Now it's time to work on our fins. The easiest way is to start with a square. You'll need to figure out what size fits your rocket best. My square is about 9 and a half centimeters on a side. Cut a diagonal. You'll then end up with two triangles. And those two triangles should be congruent. Those triangles are going to become four fins.

Cut a partial altitude of the triangle. Remember the altitude is the distance from the apex to the base. I'm going to first draw in my altitude half way up on one triangle and half way down on the other triangle. So this is what you have. Then I'm going to cut along those lines.

Nest the two triangles together. You want them to be good and flush on the bottom. So there we

have our fins.

Remember this flared end that we pre-cut. We're going to set our string to the side and insert the rocket fins up into the rocket, making sure that you're pulling the string clearly down beside the fins and not getting it caught on any of the foam insulation.

And then, you're going to need your third and final zip tie to zip that end of the rocket closed. Wrap it around and go very, very tight. The nose has to be super tight, the tail can be pretty tight. Trim off your excess. And there you have a final finished rocket.

We're going to go outside and launch the rocket off of a meter stick. Before we go though, we need to prepare our meter stick.

It's important that you realize how this will be launched. The rubber band is going to attach to the end of the meter stick and then you will be pulling back and measuring where the nose is on the meter stick. So it's important that the rubber band is at the 0 end as you will actually be pulling it back all the way to 30 centimeters.

So that we can measure the elevation angle we're launching at, we will use our elevation meter. And that is going to be attached with the line indicated on the meter at 60 centimeters. So align the slum line up with 60 centimeters. Then we'll tape it on with a little bit of tape.

The objective of this activity is to determine the best angle to launch your rocket from in order to achieve the greatest distance from your launch site. If you happen to have two friends helping you, one can measure the angle, the other can measure the linear distance.

Thanks for watching and have a fantastic time launching your foam rockets!