

## 4-H Rocketry – First Year Cheat Sheet

I recommend that you build two rockets. I can provide the kits, or you can follow my guidance below in choosing your own. At the first meeting, we'll assemble your rockets. I have the correct glue and all the tools you'll need, and I'll also provide a few basic extras. We'll probably have the first meeting in cold weather, since glue dries better when the heat is on.

Our second meeting will be all about finishing the rocket. To get a smooth, attractive paint job, you'll need to do some priming and sanding first. I'll teach you how to do this with some practical examples and you'll apply your first coat of primer to your rockets. Afterward, you'll take your rockets home with you to do additional sanding and priming.

Our third meeting will be the launch! You'll prepare your rockets for flight, and you'll get to launch your own rockets as well as some of mine. I'll provide the launch equipment, rocket engines and other necessary supplies.

Every time you launch a rocket, there is a risk it will be lost, destroyed, or damaged, so we'll do a couple of things to make it easier for you. First, remember that I said you'd build two rockets? When one of your rockets is on the launch stand, the other will be safely away from it; if the rocket you fly is lost or destroyed, you still have one to show.



Second, we'll launch your rockets in primer; it's easier to repair damage to a rocket before you paint it.

After the launch, you'll take your rockets home and paint them the same way you primed them. If you follow my instructions carefully, you can get a real show-ready finish. If your rockets include decals you may want to schedule some extra time with me to apply them. I'll do my best to be available when you need help.

### Kit Choices

If I provide your rocket kits, one of them will probably be the Estes *Baby Bertha*. The *Baby Bertha* is a surprisingly economical kit, fairly easy to assemble, and very easy to prepare for flight. The second kit I will recommend will probably be an Estes *Alpha* or *Quest Astra*. Both of these rockets are easy to build and fly, but different enough from the *Baby Bertha* to stand out if you show them side-by-side.

If you choose to buy your own kits, there are some requirements you should know about. First of all, you should buy kits marked “**Skill Level 1**” only. You **must not** buy “E2X” or “RTF” rockets, as they involve little or no building, and you must not purchase kits having skill levels of 2 or higher.

I also think you should avoid rocket kits that are too small. The *Alpha* and *Astra* kits mentioned above have body tubes about an inch in diameter, and the *Baby Bertha* has a 1.6" diameter tube. Packing the parachute into a larger tube is just easier than packing it into a small one. Several common "beginner" kits have smaller body tubes; the Estes *Hi Flier* and *Viking* kits have tubes a bit smaller than 3/4" in diameter, and the Estes *Star Trooper* is just half an inch! Getting the parachute or streamer packed into such a small rocket is tough.

Also, smaller rockets are less impressive to the judge at the Fair. If you choose a small kit and another participant builds a bigger one, he or she has a definite advantage.

### **What will this cost?**

Well, there are several things that you'll have to pay for, but I'll do my best to help you keep your costs down.

First of all, the kits. If I provide the kits, the price per kit should be between \$7.00 and \$10.00 each; the exact price will depend on how many people participate. The more kits I buy, the lower the overall price will be. If you choose to buy your own kits, your prices will probably be higher.

I'll provide the glue and tools to build the rockets, so you won't have to purchase any of that. You will need to purchase a can of sandable primer and some sandpaper. I recommend Rustoleum Filler Primer in gray; Menards has the best prices for Rustoleum that I've found in the local area. I also recommend a good brand of sandpaper like 3M... cheap stuff like the dollar stores sell won't last very long and so probably won't save you any money. You can get by with just "Fine" grade sandpaper, but for a really nice finish you should get some "Fine" and some "Very Fine." Finally, you'll need some spray paint; any brand will probably work fine, but Rustoleum 2X paints will require fewer coats to get a good finish. If you have cans of spray paint left from other projects that you'd like to use, they'll probably work fine, but please talk to me before you use old paint on new primer.



Some paints just aren't compatible with each other.

Finally, at the launch you'll need rocket engines. Each model rocket engine is good for one launch, and if you purchase them yourself you'll pay around \$10.00 or more for a pack of 3. Instead of that, I can supply them to you for \$1.00 per flight on the day of the launch; generally, you'll launch your Fair rockets one time each (before the Fair), so the cost for that day would normally be \$2.00.

So given all that, the best case price will be \$16.00 plus whatever you pay for primer, sandpaper, and spray paint. Of course it's possible, depending on what kits you wish to purchase (and what sort of price I can get on them, as I mentioned), that your costs could be higher than that, but I'd be surprised if you paid more than \$20.00 for kits and engines for the whole project.

### **Where To Learn More**

I have a website where you can learn about the project. There are pictures and even a couple of videos of previous 4-H launches. You can find that information here:

<http://rocketry.gonnerman.org>

You can find more information about the kits I mentioned above on the websites of the manufacturers:

<http://www.estesrockets.com/>

<http://www.questaerospace.com/>