

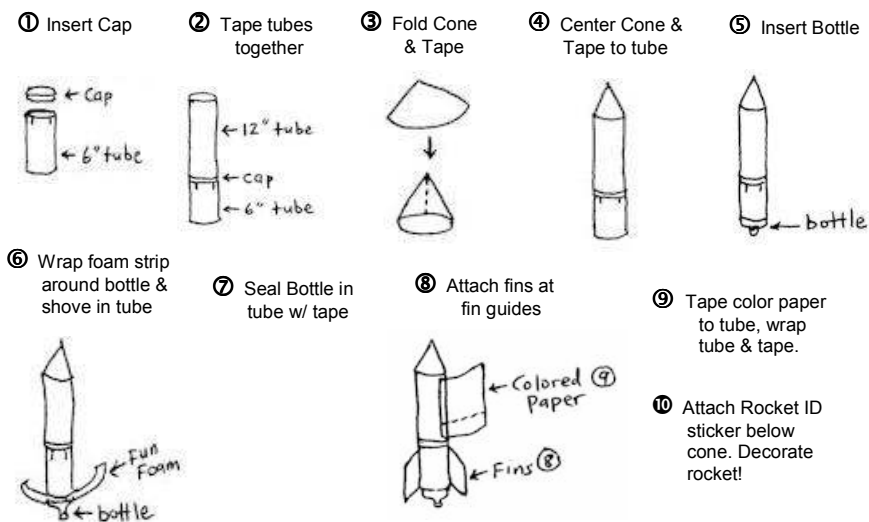
Rocket Kit:

Each rocket kit contains the following items:

- 12" cardboard tube
 - 6" cardboard tube, with 3 marks for placement of fins
 - 1 White tube cap
 - 20 oz. plastic soda bottle (empty)
 - 1 strip of Fun Foam
 - 1 fan-shaped cardboard piece for nose cone
 - 3 fins
- Color paper, stickers and markers will be available for decorating the rocket.
- The plastic bag that contains the pieces of the rocket kit can be reused for wrapping your completed rocket at the end of the derby.

Rocket Construction:

- Scissors and clear packing tape will be available in the assembly area for completing your rocket.



1. Insert the tube cap onto the end of the short 6" tube.
2. Stack 12" tube onto capped end of short tube. Tape the tubes together.
3. Shape the fan-shaped cardboard into a nosecone and tape together, making sure that the opening fits onto the cardboard tube.
4. Center the nosecone onto the end of the 12" tube, and tape the nosecone onto the tube. Completely cover the nosecone with tape.
5. Insert the plastic soda bottle into the 6" tube, with the opening sticking out.
6. Wrap the strip of fun foam around the top of the bottle, and shove it into the cardboard tube. The fun foam keeps the bottle from moving around in the tube.
7. Seal the bottle in tube with tape.
8. With a pen, mark 3 equally spaced lines around the 6" tube. These lines will serve as fin guides. Place each fin onto a fin guide on the 6" tube, pointing the sharpest corner toward the nosecone. Tape fins SECURELY onto tube, and cover completely with tape.
9. Wrap the rocket body with 1-1/2 sheets of color paper (will be provided), and tape onto the rocket. Tape the color paper to the tube before wrapping around tube.
10. Attach Rocket ID Sticker below nosecone. Decorate rocket with markers, stickers, etc.

Rocket Derby Rules & Procedures:

- Each scout must be registered.
- During check-in each scout will receive a sticker, and a flight card with his rocket number. Place sticker on rocket below the nosecone. **DO NOT LOSE THE FLIGHT CARD!** The card is used to record the flight times of the launches.

ROCKET:

- No material other than what is provided may be used in the construction of the rocket.
- All completed rockets are to be placed in the staging area.

LAUNCH:

- All rockets will be launched at a pressure not to exceed 85 PSI.
- Once the rocket is pressurized, no contestant can touch or approach the rocket.
- If the nosecone is crunched after the first launch, the cone may be reshaped before the second launch.
- Each scout must be present to launch his rocket.
- The launch area will be marked off with safety tape. Only the scouts currently launching and the launch officials are permitted inside the launch area during the competition. All others must stay outside the designated launch area.
- Each scout may retrieve only his own rocket.
- There will be two launches per scout. The total time for both launches will be the final score.
- Timing of the rocket starts when the rocket leaves the launch pad, and stops when the first part of the rocket hits the ground or when the rocket disappears from the judges' sight or when the rocket impacts or gets entangled in an object (e.g. the rocket collides with a tree.)
- Medals will be awarded to the scouts with the top 3 scores, for each rank.

Cub Scout Achievements

This event satisfies the following Cub Scout achievements and electives:

Wolf Elective 5g:	Make a model rocket.
Bear Achievement 21f:	Make a model of a rocket.
Bear Elective 1d:	Build a model of a rocket or space satellite.
Webelos Scientist 5:	Show the effects of air pressure.
6:	Show the effects of water & air pressure.
7:	Build and launch a model rocket.

What Makes the Rocket Fly?

The compressed air that is pumped into the bottle builds up a lot of pressure inside the rocket. When the air is released, the air pressure forces the rocket to fly up. This is Newton's 3rd law of motion at work. The water adds extra lift and softens the noise. The rapid decompression of the air in the bottle after the launch causes a change in temperature. This causes a slight cooling, and the water molecules condense into tiny droplets. The thousands of tiny droplets form into fog in the bottle.