

CAMP JEREMIAH JOHNSON

2-LITER BOTTLE ROCKET CONSTRUCTION PLANS



INTRODUCTION

In the following pages are instructions on a simple to build 2-liter water rocket. Please note that both the nose cone, and decorations are optional.

Each den or group should plan on bringing a rocket for approximately every 6 youth (10 youth = 1-2 rockets, 12 youth = 2 rockets etc.) Building these should make for a fun pre-camp activity.

The launchers, air source, and rocket fuel (water) will all be provided, as well as an instruction session that will start with a focus on safety.

Most people are quite surprised when they witness their first launch. The water rockets leave the launch pad at a speed of between 60 to 70 miles per hour! For that reason, as well as in case we have a bottle that pops, the launch pad will be approximately feet away from people.

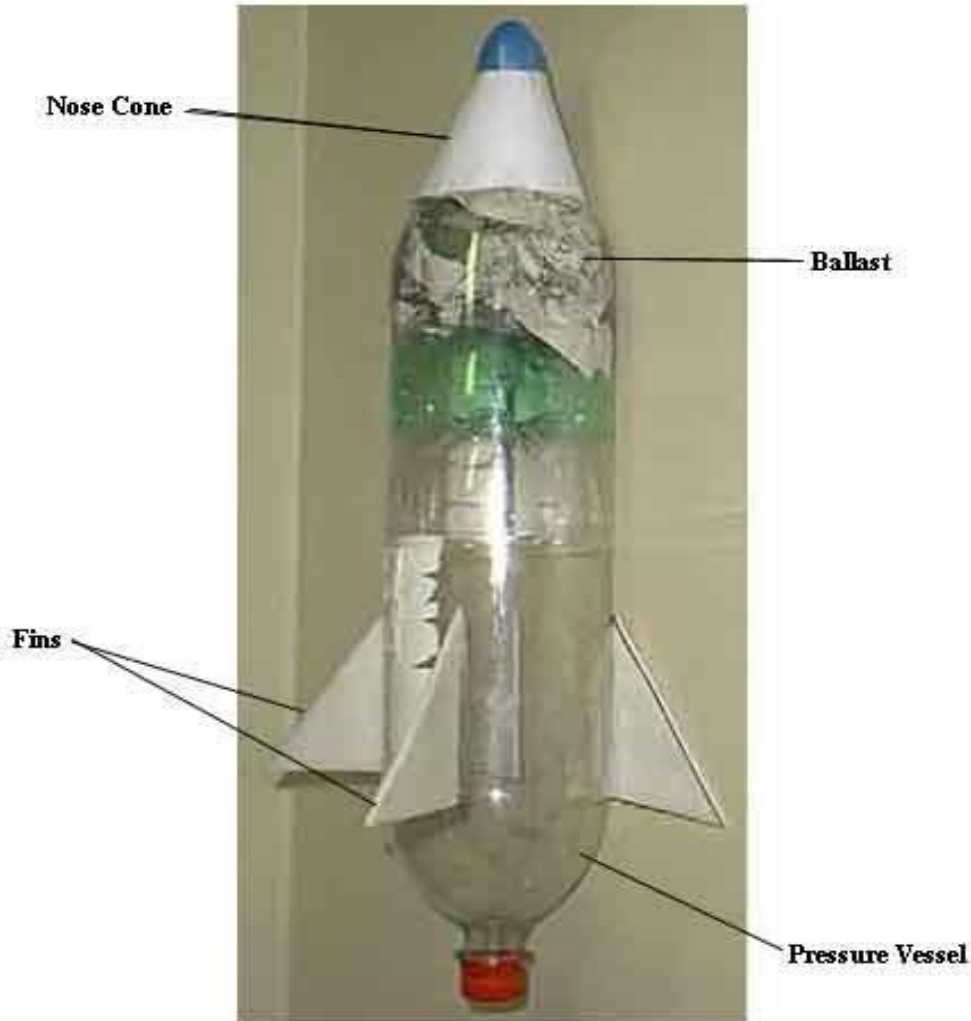
The youth can help place the rocket on the launch pad, then step away to “mission control” to help remotely pressurize the rocket, and then pull the cord to launch.

MATERIALS



- 2 - Two-Liter Bottles
- (for Rocket and Ballast section)
- Newspaper (Ballast)
- Foam Tray, or old real estate plastic sign, or foam poster board (Fins)
- Paper (Nose Cone) – Optional
- Tape (packing tape and duct tape work best)
- Scissors
- Decorations (spray paint, markers, stickers)
- Help from an adult

PARTS OF A ROCKET



- Nose cone (optional) – for aerodynamic effect
- Ballast – adds mass to rocket to increase stability
- Fins – for stability
- Pressure vessel – source of rocket propulsion

ROCKET BODY



Step 1-
Cut the bottom
portion of one of
the two liter
bottles off.

ROCKET BODY: BALLAST



Step 2-

Find something to add a little weight to your ballast. You could use, rolled up newspaper, sand, foam peanuts, a small amount of gravel etc. Whatever you use, place in the top half of two-liter bottle.

ROCKET BODY CONTINUED



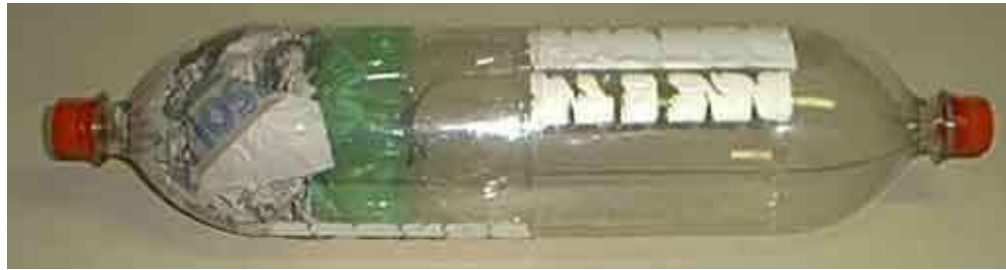
Step 3-

Push bottom half of two-liter bottle upside down into top half – to keep ballast in place.



Use small pieces of tape to secure bottom piece inside bottle.

ROCKET BODY CONTINUED



Step 4 -

Place two-liter bottle (pressure vessel) into top half. Try to make bottles straight. Use little pieces of tape to secure bottles. When you have them lined up straight, wrap a piece of tape all the way around the seam.

WATERPROOF MATERIALS FOR FINS

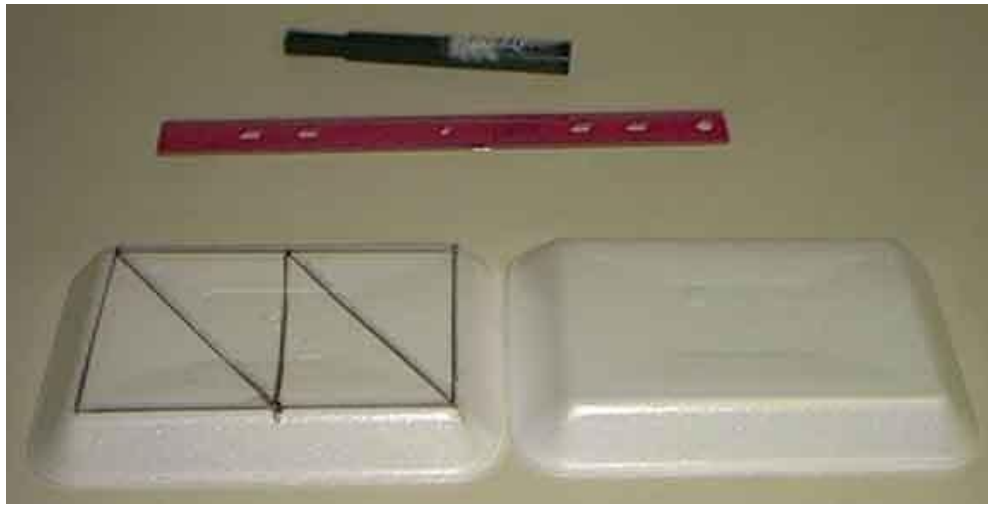


Material suggestions:

- Milk or Juice Bottle
- Foam trays
- Election signs
- Corrugated Plastic

Do not use cardboard, cardstock or other paper items.

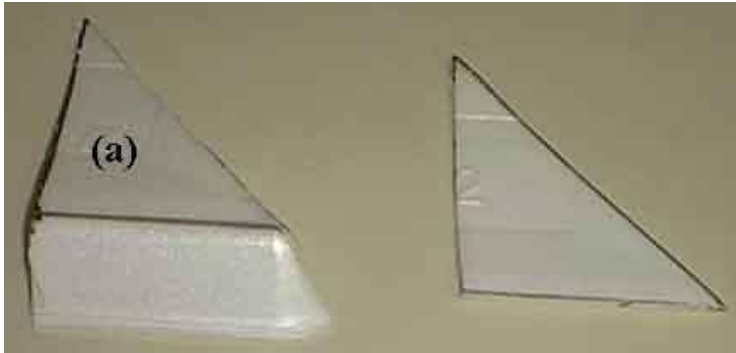
FINS



Step 5 -

Use marker and draw fin patterns on foam trays.

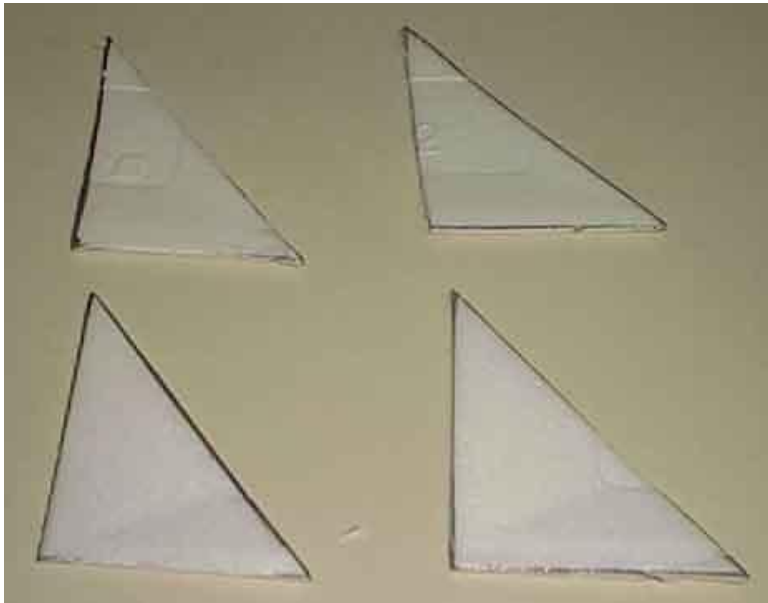
FINS CONTINUED



Step 6 –
Cut fins out.

Note:

If you leave the sides of
tray attached to the fins –
the rocket will spin in
flight.



FINS CONTINUED



Step 7 –

Attach fins to rocket using small pieces of tape. Then tape to bottle on both sides of fin full length.

NOSE CONE: MATERIALS



Note: the nosecone is optional

You can use almost anything you can imagine for the nosecone. It's not safe to have a point on your nose cone. If you choose to make a nosecone, it will need to be rounded. To create a rounded tip, use one of these possible items:

- Egg carton
- Plastic Easter egg
- The top of a 16 oz. water bottle
- Toilet paper tube



NOSE CONE



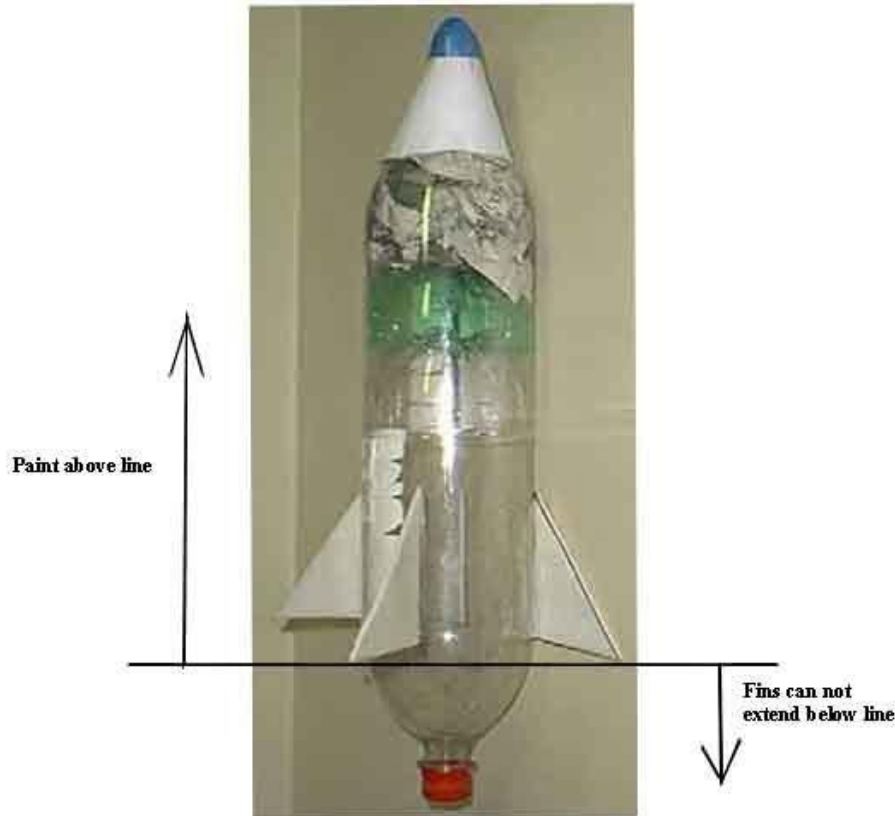
Step 8 - Roll paper into a cone. Use tape to hold paper in place. Place plastic egg shell (or whatever you're using) on the cone as tip. Use tape to fasten tip to cone.

NOSE CONE CONTINUED



Step 9 - Fasten nose cone to body with duct tape.

NOSE CONE CONTINUED



- You may decorate with spray paint, tape, stickers etc.
- The bottom fifth of your rocket must remain clear of any decoration that will prevent it from hooking to the launcher.
- Fins cannot extend past the part of the rocket that starts to curve.

TIPS

- Choose a higher quality 2-liter bottle (no store brand bottles – they're much thinner).
- Try to make body smooth (no kinks with tape).
- Do NOT use a hot glue gun to fasten parts of your rocket together. It will weaken the bottle and can lead to detonation on the launch pad! The same is true for epoxy. Duct Tape works best for assembling the rocket.
- Do not leave two-liter bottles in hot car.