

STOMP ROCKET

A paper rocket you launch by stomping on a soda bottle. No fire, no motors, and you can fly it again and again. Building takes about 30 to 40 minutes. This is the same rocket our younger class builds.

SAFETY FIRST. Everyone wears safety glasses or sunglasses, including the stomper. Point the launch tube away from people. Never put your face over the launch tube. One rocket in the air at a time, and nobody runs to get it until a grown-up says clear.

WHAT YOU NEED

For the rocket

- 1 sheet of printer paper
- 1 empty cereal box (for fins)
- Cardstock or a manila folder (nose cone)
- Clear tape and masking tape
- A pea-sized ball of modeling clay or play dough
- Scissors, pencil, ruler
- Markers or stickers

For the launcher

- 1/2-inch PVC pipe, about 5 ft (hardware store)
- 1/2-inch PVC tee, one 90° elbow, 2 end caps
- 4 ft of 3/4-inch clear vinyl tubing
- Empty 2-liter soda bottles (collect a few)
- Duct tape
- A grown-up with a hacksaw or PVC cutter

No launcher? A store-bought stomp launcher works too, as long as its launch tube is 1/2-inch PVC size.

PRINT THE TEMPLATE PAGE RIGHT. Print at "Actual size" or 100%, not "Fit to page." The square on the template page should measure exactly 5 cm (2 in).

BUILD THE LAUNCHER (GROWN-UP STEP)

1. Cut the PVC into one 45 cm (18 in) launch tube and two 20 cm (8 in) legs.
2. Put the tee between the two legs with end caps on the leg ends. That's the base. Push the elbow into the tee's open side, pointing up, then push the launch tube into the elbow.
3. Slip one end of the vinyl tubing over the bottom of the tee (warm water softens it). Duct tape the other end tightly to the mouth of a 2-liter bottle.
4. Wrap every joint with duct tape. Bottles split after a few dozen stomps, so keep spares ready.

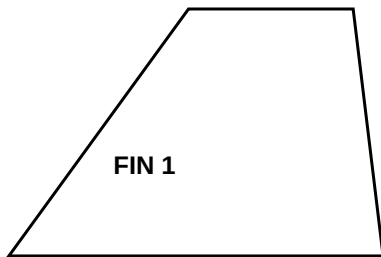
1. **Roll the body.** Roll a sheet of printer paper the long way around a leftover piece of the 1/2-inch PVC. Snug, but loose enough to slide freely. Tape the seam along its whole length.
2. **Seal the top.** Slide the paper tube up so about 2 cm hangs past the end of the pipe. Pinch and fold that end flat, then tape it airtight. A leaky top is the number one reason a stomp rocket won't fly.
3. **Cut the fins.** Cut out the 4 fins from the template page. Trace each one onto cereal box cardboard and cut them out.
4. **Make the nose cone.** Cut out a nose cone and trace it onto cardstock or a manila folder. Roll it into a cone so one edge reaches the dashed line, then tape or glue it. Press the ball of clay into the tip from inside, then tape the cone over the sealed end of the tube. The clay moves the weight forward so the rocket flies straight.
5. **Mark the fin lines.** Cut a strip of paper, wrap it snugly around the bottom of the tube, and mark where it overlaps. Unwrap it, cut on the mark, fold it in half, then in half again. Wrap it back on and put a pencil dot at each end and fold. Lay the tube in the corner of a door frame and draw a straight line up from each dot, about 6 cm long.
6. **Attach the fins.** Line up each fin's long straight edge (the root) on a pencil line, even with the bottom of the tube, with the slanted edge pointing toward the nose. Tape it on with two small strips of clear tape on each side.
7. **Decorate and name it.** Markers and stickers go on now. Write your name on the tube so a lost rocket can find its way home.
8. **Fly!** Slide the rocket all the way onto the launch tube, step back, and stomp. Blow into the launch tube to pop the bottle back up between launches.

TRY THIS EXPERIMENT. Fly your rocket once with the clay in the nose and once without. Then try taping the fins at the top instead of the bottom. Which flies straighter? That's the science of stability, the same idea real rocket builders use.

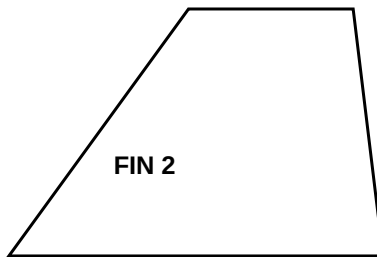
SHARE YOUR LAUNCH. Tell us how high it flew. Email info@thechurchofmanyhands.org, and join us at a Rocket Lab class when you can.

FINS

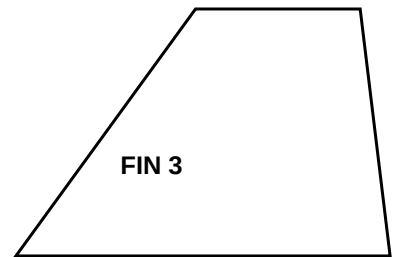
Trace each fin onto cereal box cardboard. The root is the long bottom edge that sits against the tube.



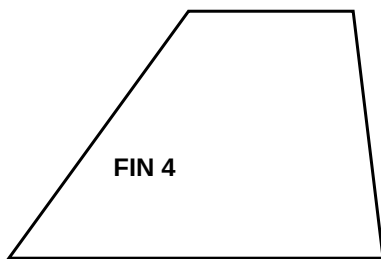
ROOT: glue this edge to the tube



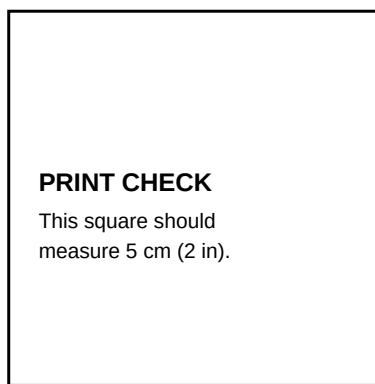
ROOT: glue this edge to the tube



ROOT: glue this edge to the tube

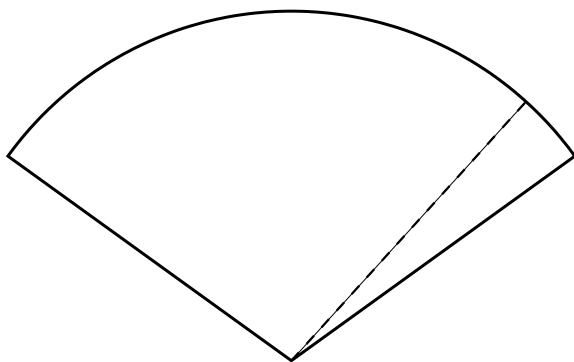


ROOT: glue this edge to the tube

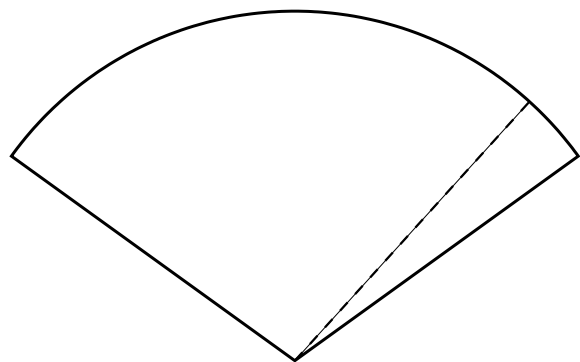


NOSE CONE

Roll into a cone so the edge reaches the dashed line. Glue or tape it closed.



NOSE CONE 1



NOSE CONE 2 (spare)