

Build Your Own SLS BOTTLE ROCKET



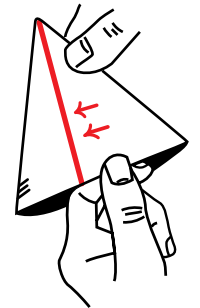
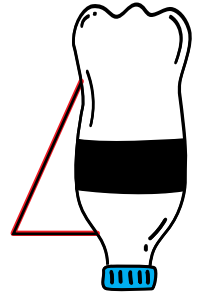
What You'll Need

- 16-20 oz. plastic bottle (empty)
- Bicycle floor pump (with pump needle)
- Cork (or rubber stopper)
- Safety glasses
- Power drill
- Drill bit (same size as bike pump needle)
- Scissors
- Cardboard or poster board
- Duct tape
- Milk crate
- Paintbrush
- Paint

Adult
Supervision
Required!

Build Instructions

1. Safety first! Make sure you put on your safety glasses before moving on to the next step.
2. Insert your cork into your empty plastic bottle to make sure it's a tight fit.
3. If needed, wrap your cork in duct tape until it fits snugly inside your empty plastic bottle.
4. Remove your cork from the bottle, and with adult assistance, drill a hole through the top of the cork to the bottom of the cork.
5. Attach your bike pump needle to the nozzle of your pump, then press it through the hole in your cork until it fits securely. If needed, trim your cork so that the needle sits flush or exposed.
6. Wrap the nozzle and cork together with duct tape to restrict excess air flow.
7. Use scissors to cut out the template needed for the rocket fins.
8. Use the template to trace 4 fins on your cardboard, and then use your scissors to cut them out.
9. Tape each fin to the flattest part of your bottle. Refer to the image to the right.
10. Cut out the template for the nose cone.
11. Bring one cut end of the template over to the other in a cone shape. Tape the ends together. Refer to the image to the right.
12. Tape your nose cone to the bottom of your plastic bottle. This will act as the top of your rocket.
13. Time to paint! Get out your paintbrush and add some color to your rocket. We like orange and white the best!
14. While you're waiting for your rocket to dry, grab your milk crate and flip it upside down.
15. Feed the bike pump cord through an opening at the bottom of the crate, then using duct tape, secure the cork and pump nozzle through an opening at the top so your rocket sits on the crate like a launch pad.
16. Hooray, you've completed all the build instructions. Now it's time to launch.

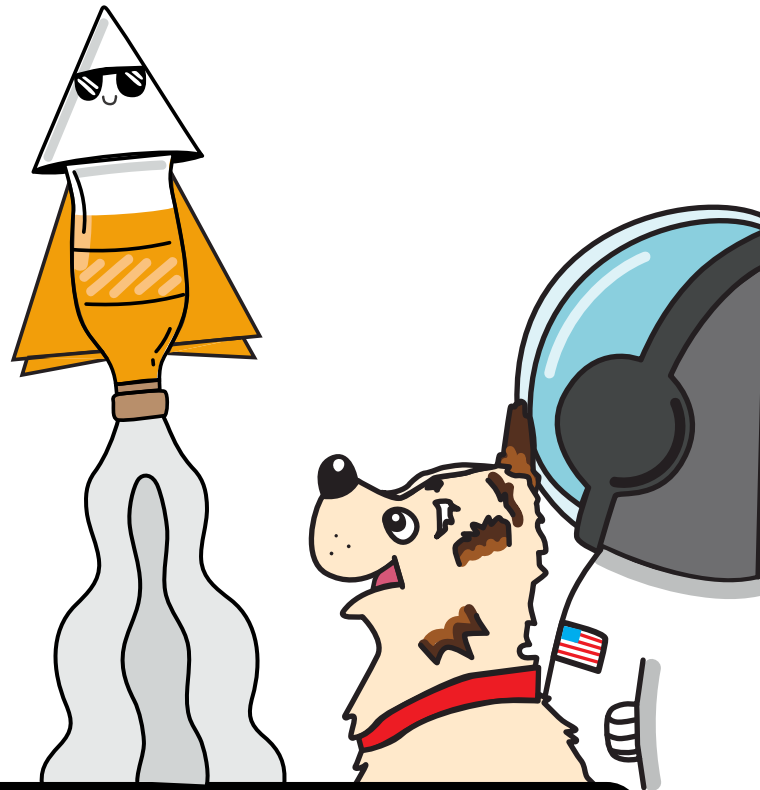


HEY! This is an outdoor activity, so get outside and find the perfect launch site.

Flip For More!

Launch Instructions

1. Make sure you have your safety glasses on and you have an adult nearby to help!
2. Insert the cork into your rocket and make sure it has a tight seal around the opening.
3. Stand at a safe distance and pump air into your rocket until the cork can no longer withstand the pressure. In other words, **LIFT OFF!**



So, What Makes It Go?

As you fill your plastic bottle with air using the bike pump, incredible pressure begins to build inside.

Eventually, the pressure inside becomes so great it has to escape and pushes the bottle upward.

In rocketry, we call this **Thrust!**

The more pressure you add to the bottle, the more thrust you create, which makes the rocket go higher.

The highest point is called the rocket's **apogee**.

Did You Know?!

- One SLS produces 8.8 million lbs. of thrust, that's equal to about 880 jet engines!

SLS reaches an apogee of more than **1,100** miles.

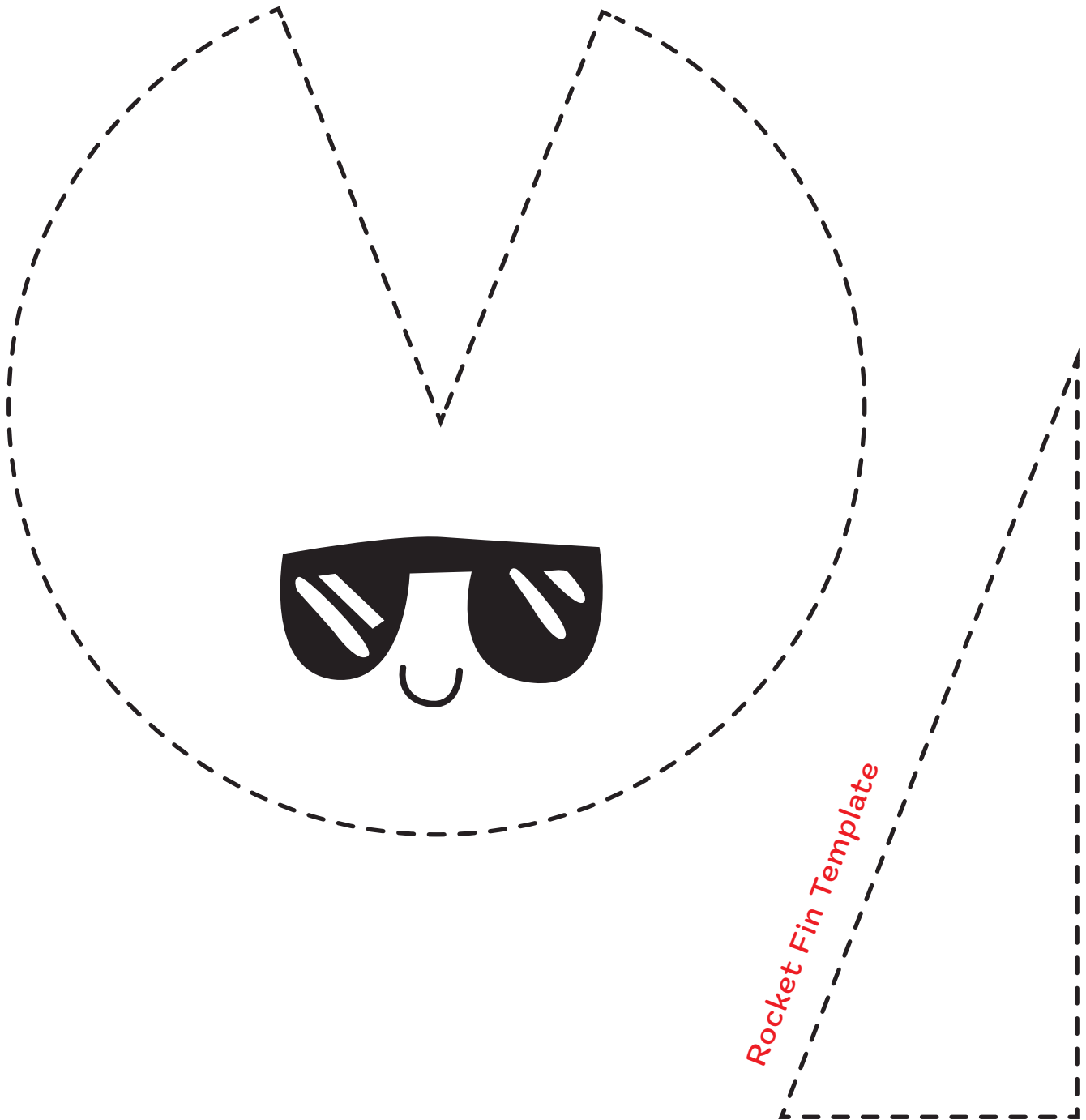
That's more than **16,000** football fields!



Bottle Rocket Templates

Follow the build instructions and cut along the dotted lines.

Nose Cone Template



Guess What?!

We're going back to the Moon, and this time we're going to live, learn, and explore! As a member of the Artemis Generation, NASA invites you to be a part of the story.

"Hooray for SLS!," written by Lane Polak and illustrated by Heather Legge-Click, is the first in a series of children's books that introduces young explorers to the unique elements needed for the Artemis campaign, like NASA's deep space rocket, SLS (Space Launch System).

As we travel deeper in space than we ever have before, let's take the time to celebrate.

HOORAY FOR SLS!

