

# STEP RIGHT IN!

## EXPERIMENT: NEWSPAPER TENT

Every carnival needs a tent or two ... where else are you going to buy tickets or get refreshments? Be an engineer and build your own tent from newspapers as you learn what shapes make structures strong.

### MATERIALS

Lots of newspaper, about two full papers (traditional broadsheet size, like the Chicago Tribune)



Masking tape or duct tape

Stapler

Pipe cleaners

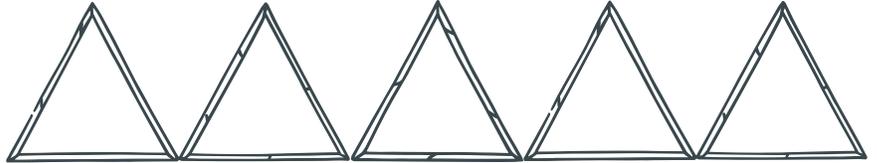
Craft sticks (optional)

Sheet (optional)

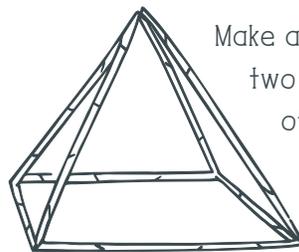
### INSTRUCTIONS

Make newspaper rolls from two sheets of flat newspaper. Use open, two-page spreads, not single sheets. Roll them tightly from corner to corner – the tighter the roll, the stronger the support. Secure the end with tape. You'll need 37 rolls.

Use three newspaper rolls to make a triangle, attaching at each corner with staples. Make 11 triangles. The last four newspaper rolls will be used for bracing your tent.



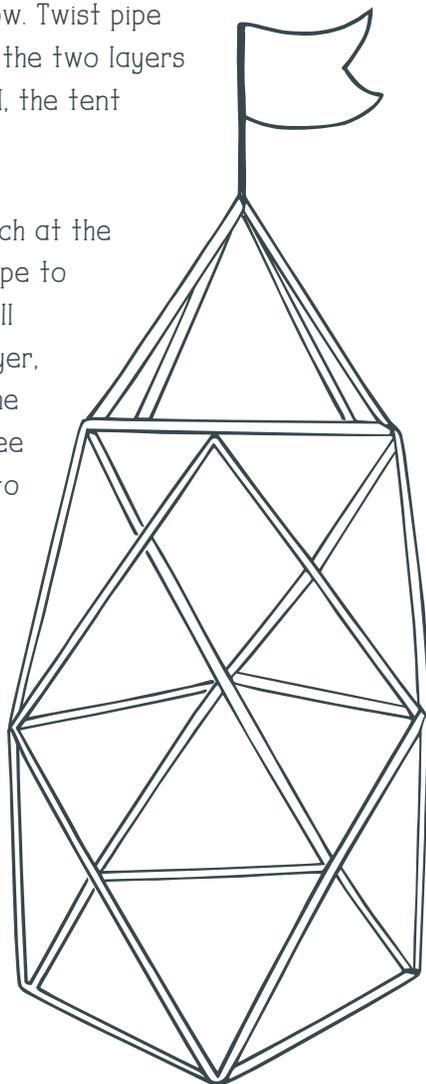
Prepare the base of your tent. Lay five triangles flat on the ground so that a side of each triangle forms a line. Attach the triangles to each other along the bottom edge with staples and/or tape. Prepare the middle layer by attaching four triangles to each other in the same way.



Make a pyramid for the top by attaching the last two triangles at their tops, opposite each other, and using two straight newspaper rolls to complete the square base.

Get someone to help hold things in place as you get ready to erect your tent! Take the bottom layer of five triangles and form them into the shape of a pentagram and staple the last two bottom corners together. The triangle points should stand upward somewhat but will tend to fall over, and that's OK. Take the middle layer of four triangles and position them on top of the bottom layer so that the bottom corners touch the pointed tops of the layer below. Twist pipe cleaners around each spot where the two layers join. As you work your way around, the tent should be more upright.

Place the pyramid on top and attach at the corners with pipe cleaners. Use tape to secure the last two newspaper roll braces diagonally from the top layer, forming a diamond-shaped door. The tent should be sturdy, but feel free to add tape or even craft sticks to reinforce any wobbly corners.



## GAME ON

Your tent is sturdy enough to handle some weight, so cover it with a sheet and even put a flag on top! Use your tent at your science carnival as a spot for tickets, prizes or snacks. You can also experiment with different shapes of tents. Can you make a larger one? Or a taller one? See what you can design!

## MORE WAYS TO PLAY WITH TENTS

There are many ways to make tents, so get creative! Try making a fort from blankets and pillows, or hang a hula hoop up high and drape it with sheets.

## LIKE THIS ACTIVITY?

You could be a ...

- Architect
- Construction manager
- Engineer
- Building inspector

## WHAT'S HAPPENING?

Triangles are considered the strongest shape because they can handle heavy loads without collapsing. Hold one of your newspaper triangles and apply some force on the sides. The triangle should feel sturdy and hold its shape. If you put force on a square or rectangle, the shape can tilt or collapse. The triangle's strength is why architects often use it in structures. Bridges are made up of trusses, which are triangles that share sides and connections. Look for triangles the next time you see a bridge or building under construction.

This tent is similar to a geodesic dome, which is a spherical or partially spherical structure formed from triangles. You can find geodesic domes on playgrounds as climbing structures. Another example is the giant sphere at Epcot.