

# How to Create a Water Column

You will need a 3-meter-tall (10-foot-tall) water column in which to test your prototype. Follow the steps below to make a water column from soda bottles.

**Time:** about 2 hours spread over three to five days.

## Materials

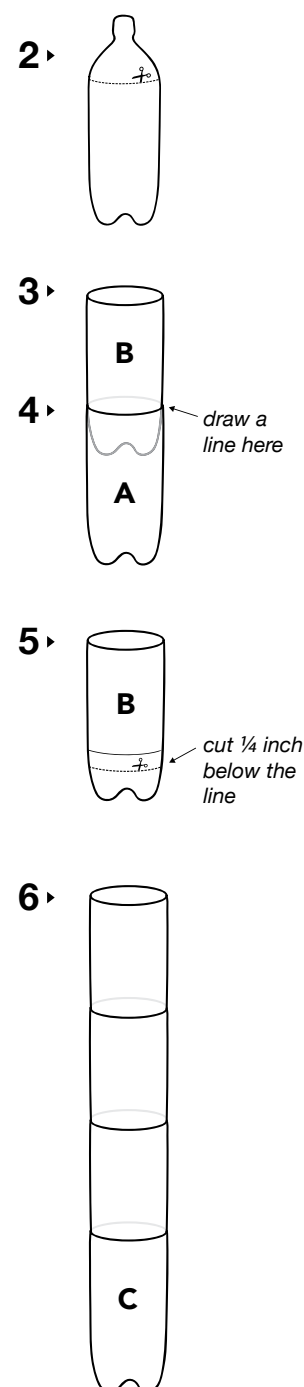
- 20 2-liter or 3-liter soda bottles (note that bottles with little curve to them work best)
- Plastic bonding adhesive
- Waterproof caulk
- Waterproof duct tape or plumber's tape
- Permanent marker

*Note: materials are available at most home improvement stores.*

## Construction Process (see drawings to right)

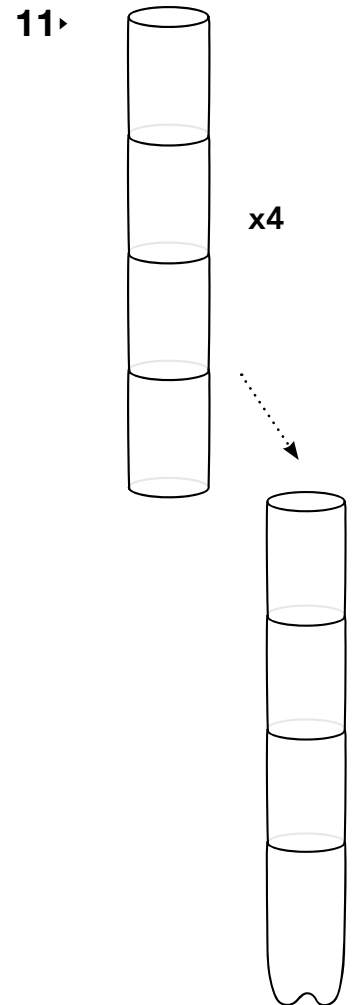
- 1 Remove all labels from the soda bottles and make sure they are clean.
- 2 Cut the tops off four soda bottles where the bottle straightens out.
- 3 Place the bottom of one soda bottle (B) into the open top of another bottle (A). Push until the bottle on top (B) fits securely.  
Mark a line on bottle B where the two bottles meet.
- 4 Cut bottle B about a quarter inch below the line you marked.
- 5 Repeat this process for the third and fourth bottle. When you finish, you should have one bottle (C) on bottom that still has its bottom intact with three bottles without tops or bottoms lined up on top of it.
- 6

Follow the instructions on the plastic bonding adhesive to glue the bottles together in the configuration described above. Make sure that the adhesive is spread thoroughly over the plastic and that the bottles are nested inside each other snugly. Allow time for the adhesive to set before moving on to the next step. Follow the package directions to caulk around the edges where the bottles meet. Pay particular attention to any gaps.



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- 8 Use the waterproof duct tape to seal the edges where the bottles meet. Take care to press the tape down gently but firmly. Pressing too hard on the bottles can sometimes cause the adhesive to crack.
- 9 Fill the bottle with water and watch carefully for any leaks. Even a small leak will be a significant problem when the water column is fully assembled. If you see a leak, mark it with the permanent marker. Once the bottles have fully dried, use the caulk and duct tape to close any leaks. Retest and repair as needed.
- 10 Repeat steps 1-9 four more times, so that you have assembled and tested 5 sets of four bottles for water-tightness.
- 11 Once the five segments are watertight and thoroughly dry, combine the segments using the same method used to assemble the bottles in steps 3-5. Adhere, caulk, and tape the segments together using the same methods you used to adhere the individual bottles in steps 7-9.
- 12 Take the water column outside to test it. Keep the column steady during testing by taping it to a pole, wall, etc. Fill the column and check for any leaks. Mark and repair any leaks before testing again.



**Alternative:** A 3-meter (10-foot) length of 10-centimeter (4-inch) PVC pipe capped at one end can be used as an alternative to the water column described above.

## Using the Water Column

The water column must be secured before it is used to test your prototype. If possible, secure the water column to a pole, wall, or other permanent structure before filling it. If that is not possible, you might tape the water column to a ladder. Alternatively, cut a hole the same width as the water column in the side of a large box. Place the water column through the hole and secure it with rocks, bricks, or cinderblocks.