#FontanaTogether

# Big-Bubble Wand

Have you ever tried to blow a bubble, and no matter how hard you try, the bubble just will not form? Why does this happen? Why do bubbles form at all, and why is it harder to blow bubbles sometimes? In this activity, we will explore the limits of how big our bubbles can get!

## Materials:

- Two dowel rods (at least ½" diameter works best.)
- Two screw eyes (a closed loop with a threaded base) that can screw onto the dowel rods
- Yarn or baker's twine (at least 18 feet or 6 meters)
- A washer
- Bubble solution (Optional)
- A bucket or large container to hold bubble solution
- Outdoor area with space to run!
- An adult helper
- One or two measuring tapes (a total length of at least 3 meters)

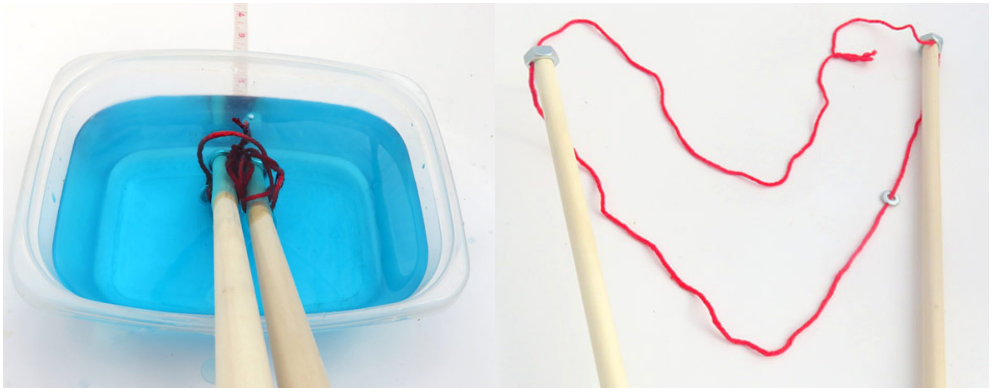
## Prep Work:

1. This activity could get a little messy. Everything should be done outside.
2. Pour the bubble solution into your container. If you are making your own bubble solution, pour all ingredients into your container and gently stir to combine. Try to avoid creating a sudsy foam on the surface of the solution.
3. Ask your adult helper to help you attach a screw eye to one end of each rod.

## Instructions:

1. Cut a three-foot (or one-meter) length of twine and thread it through one washer and each screw eye, making a loop. Tie the ends of the twine together (the knot can be anywhere). Screw each screw eye on a different dowel rod. This is your bubble wand!
2. Set your bubble solution container in an open area. Place your measuring tape on the ground, starting at your container and extending at least 10 feet (3 meters) against the direction the wind is blowing.
3. Hold your rods on the ends without the screw eyes. Gently touch the two screw eyes together, and completely submerge the yarn in the bubble solution.

4. Gently lift your wand from the bubble solution. Separate the ends of the rods to open the yarn loop.
5. Hold the wand away from your body and slowly walk along the measuring tape into the wind.
6. Have your helper measure the length of the bubble you create! Try it at least five times, and remember the longest.
7. Cut the twine and remove it from the wand. Save the washer!
8. Cut a six-foot (or two-meter) length of twine, and thread it through one washer and each screw eye, making a loop. Tie the end of the twine together (the knot can be anywhere). This is your new bubble wand!
9. Repeat steps 3–6 using the bigger wand. Remember the longest bubble you can create with the six-foot twine.
10. Cut the twine and remove it from the wand. Save the washer!
11. Cut a nine-foot (or three-meter) length of twine and use it to make a new bubble wand.
12. Have your helper assist you while you repeat steps 4–6, with each of you holding a wand. Measure the bubbles you create and remember the longest one created with the nine-foot twine.



- In this activity you created some of the biggest bubbles possible, with just a little string and some patience! You may have found that it was easier to create the long bubbles with the shorter twine. As the twine got longer (especially at nine feet) it may have been more difficult for the bubbles to form.

- We know bubbles can hold their shape as a result of surface tension. In fact, the bubble solution mixture that makes up a bubble's surface is composed of three very thin layers: soap, water and another layer of soap. This is called a soap film. The surface tension of the water layer is what holds the bubble together. Therefore, when the water between the soap layers evaporates, the bubble pops. To make bigger and stronger bubbles, we need to thicken the walls of soap, to prevent the water from evaporating. To do this, we added glycerin, to help thicken those soap walls and hold the bubble together! This makes for stronger, bigger and longer-lasting bubbles.