



Bubble Maker

Materials:

Bubble Wands

- Pipe cleaners
- Straw pieces (about 2 inches)

Bubble Solution

- 2 tsp sugar
- 1/2 cup warm water
- 1 cup cold water
- 1/2 cup dish soap

Instructions for Bubble Wands – Follow along with our how-to video to see these steps in action.

Triangle bubble wand

1. Slide three straw pieces onto a pipe cleaner, making sure to leave 1 inch of pipe cleaner uncovered at the end.
2. Bend the pipe cleaner into a triangle shape and twist the ends together.

Pyramid bubble wand

1. Create a triangle bubble wand but leave the short ends of the pipe cleaner open.
2. Twist a second pipe cleaner on one of the short ends of the first pipe cleaner, so you have one long pipe cleaner attached to your triangle.
3. Slide two straw pieces on the long pipe cleaner and push the end of the pipe cleaner through the straw to make a second triangle.
4. Add another pipe cleaner to a short end and add a straw. Fold to create a third triangle so it meets with another shorter end.
5. Twist the short ends together to complete your pyramid shape.

Square bubble wand

1. Slide four straw pieces onto the pipe cleaner, making sure to leave 1 inch of pipe cleaner uncovered at the end.
2. Bend the pipe cleaner into a square shape and secure the ends to create your square.

Cube bubble wand (add more pipe cleaners when needed)

1. Create a square bubble wand, leaving the short ends of the pipe cleaner open.
2. Twist a second pipe cleaner around one of the short ends of your first pipe cleaner.

3. Slide three straw pieces onto the long pipe cleaner.
4. Push the end of the pipe cleaner through a straw on the first square to make a second square.
5. Add two more straw pieces onto the pipe cleaner.
6. Bend the first square up and push the pipe cleaner through the straw of the first square to make the third square.
7. Add one more pipe cleaner to the long end and add two more straw pieces onto the new pipe cleaner.
8. Bring the pipe cleaner under the corner of the third square, loop it around and pull it through the straw.
9. Slide one more straw piece on to the pipe cleaner.
10. Push the pipe cleaner through the straw to meet the shorter end.
11. Twist the shorter end around to complete your cube.

Now it's time to make your bubble solution.

1. Add 2 tsp of sugar into the 1/2 cup of warm water and mix well.
2. Add the sugar water, cold water and dish soap into a big bowl.
3. Use a spoon to mix them slowly, trying not to create bubbles.
4. You can double or triple the recipe easily to make sure your bubble wands can be dipped in your bubble solution completely.

Now that you have your makers and your bubble solution, it's time to blow bubbles! Dip your makers into the bubble solution and blow bubbles in cool shapes—and most importantly, have fun!

What did you learn?

In geometry, there are two-dimensional (2-D) and three-dimensional (3-D) shapes. What's the difference? 2-D shapes are flat and cannot be physically held because they have no depth; a 2-D shape is completely flat, such as a triangle and a square. 3-D shapes have three dimensions, such as width, height and depth. 3-D shapes are multidimensional, such as a pyramid and a cube.

Why do dish soap and sugar make the perfect bubble solution? It's called **surface tension**. Water, as a regular liquid, has very high surface tension—the molecules hold each other tight together. When we add dish soap in the water, it lowers the surface tension so bubbles can be made. However, it's easy for bubbles to dry out if there is only dish soap in the water. Adding sugar can slow the evaporation because sugar makes bubbles last longer.

Disclaimer: While every reasonable effort is made to provide experiments that are safe, adult supervision is recommended at all times when experiments are performed. Safety gear, such as gloves and glasses, may be required.