



BUBBLE SCIENCE!



Raccoon Creek Explorers #32

Supplies:

- Bubble solution:
 - 6 Cups distilled water,
 - 1 Cup Dawn dish soap or Johnson's baby shampoo,
 - 1 Tbsp glycerin (optional) OR 1/4 cup light corn syrup (optional)
- dish or bowl
- pipe cleaners
- plastic straws
- scissors

Vocabulary:

surface tension- the force between water molecules at the surface of water

elasticity- the tendency of a material to return to its original shape after being deformed

minimal surface shape- a shape that has the least surface area for a given volume of air

Background:

When you blow a bubble, what shape does it make? Some bubbles, especially bigger ones, tend to get kind of jiggly and wobbly, but all bubbles are more or less spherical or round in shape. Have you ever wondered why? Do you think it's possible to make a bubble in a different shape?

In this experiment, you'll make bubble wands in different shapes and see what the results are. Be as creative as you want, and make a variety of shapes and sizes!





Let's Get Started:

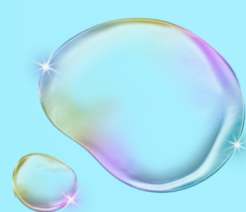
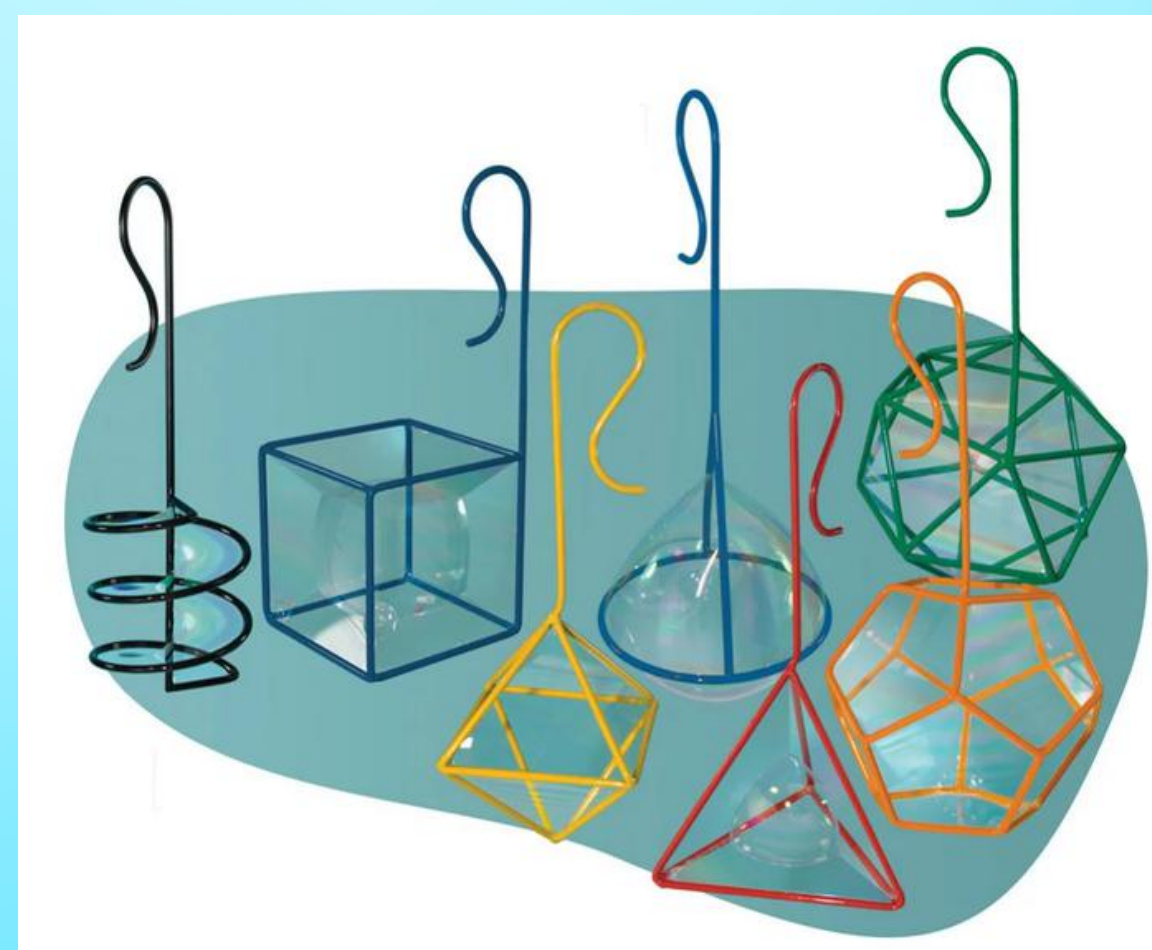
- 1.) Mix the ingredients for the bubble solution in a bowl or other container. The solution will still work with only soap and water, but it works even better with glycerin! Let the solution sit for a few hours or even over night.
- 2) Make simple bubble wands out of pipe cleaners by bending one into a fun shape like a triangle or heart, then attaching another pipe cleaner as a handle.
- 3) Make some 3D, geometric bubble wands! Cut the straws into equal sized pieces (about 2 inches) and use the pieces along with more pipe cleaners to form a cube and a tetrahedron (a pyramid).
- 4) Dip your different wands in the bubble solution and see what shape bubbles they make!



Reflect:

What other 3D shapes can you make with bubbles?

What is the biggest bubble you can make?





Apply:

How did your bubble wands turn out? Were you able to make different shapes of bubbles? Why or why not? Did some shapes work better than others as bubble wands?

Wrap Up:

A bubble is made by trapping air in a thin layer of liquid soap. The surface tension of the liquid, the attraction between its molecules, helps the bubble form and it forms in the shape of a sphere because this is the shape that allows for the most internal area with the smallest surface area. Scientists call this the minimal surface shape. The bubble is stable as long as the pressure inside the bubble is equal to the pressure outside of it. This is why, no matter what shape you make your bubble wand, the resulting bubble is always round. It is also why we use a special solution to blow bubbles. The soap in the bubble solution actually gets between the water molecules and lowers the surface tension, allowing them to spread out in a thin, flexible layer. If you blow some air into this thin sheet of molecules and let it close around itself, you get a bubble!

<https://www.instructables.com/STEAM-3D-Bubble-Wand/>

<https://www.scienceworld.ca/resource/square-bubbles/>

