

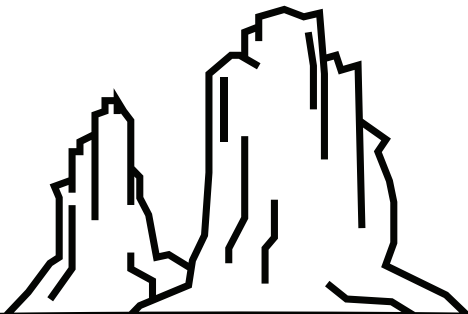


Get ready for some fun as we learn about bubbles! We will explore what a bubble is, how to make bubbles and create some cool bubble art!

## What is a bubble?

A bubble is a small pocket of gas within a liquid or solid. We can see bubbles every day in carbonated drinks, fish tanks, bubble baths, swiss cheese, boiling water and even bubble gum!

Have you ever played with bubbles? Soap bubbles are fun to play with and easy to make. All you need is air, soap and water. The soap and water create a film made of three layers, like a sandwich, where a layer of water is trapped between two layers of soap. They work together to hold the air inside this film. When the soapy film dries out or the bubble touches something that breaks the film, the bubble pops. What other kinds of bubbles have you seen or made?



## Let's Read



Find a comfortable spot and read about the weather! Here are some ideas to get you started:

- *Bubble Bubble* by Mercer Mayer
- *Bubbles Float, Bubbles Pop* by Laura Purdie Salas
- *Bubble Trouble* by Margaret Mahy
- *The Nature and Science of Bubbles* by Jane Burton
- *The Bubble Book* by Lisa Feder-Feitel

You can download digital copies of these books for free from [openlibrary.org](https://openlibrary.org). Here is how!

1. Go to [openlibrary.org](https://openlibrary.org).
2. Click the blue "sign up" button on the top right to create a free account. You will be sent a confirmation email.
3. Sign in.
4. Type the book title and author into the search bar.
5. Find your book and click the blue "borrow" button.
6. Don't forget to return your book when you are finished reading it!

## Keep going!

Set up an online reading group with some of your friends. You can read the same book, then talk about what you learned, or you can read different books and share cool bubble facts.

# Best Bubbles

How are soap bubbles made? Soap bubbles form when air is trapped between layers of soap and water. However, there are ingredients that may make your bubbles stronger or last longer. Bubbles can pop if the water between the soap layers dries out or if they land on something that breaks through the soapy film. The longer the water stays between the soap, the longer the bubbles last. Glycerin, corn syrup and sugar all hold onto water, so they are good to use in a bubble solution for stronger bubbles. Let's see which works best!

## Before you start, you should have:

- $\frac{3}{4}$  cup dish soap (Dawn or Joy works well)
- 3 cups water
- 2 tablespoons light corn syrup or glycerin
- 1 tablespoon sugar
- 3 bubble wands, wires or pipe cleaners
- 3 bowls
- Optional: 3 colors of food coloring (to tell the different solutions apart)

## Make three kinds of bubble solution:

### 1. Bubble solution 1

- Mix 1 cup water with 4 tablespoons dish soap in a bowl.
- Add 1 drop of food coloring if desired.

### Bubble solution 2

- Mix 1 cup water with 4 tablespoons dish soap in a bowl
- Add 2 tablespoons light corn syrup or glycerin.
- Add 1 drop food coloring if desired.

### Bubble solution 3

- Mix 1 cup water with 4 tablespoons dish soap in a bowl.
- Add 1 tablespoon sugar and mix until dissolved.
- Add 1 drop of food coloring if desired.

**2.** Think about which bubble solution will work the best? Why do you think so?

**3.** Bring your solutions to an open area outside.

**4.** Dip a bubble wand into each type of solution, one at a time, and blow bubbles to test them out. (To make a bubble wand, twist a pipe cleaner or wire into a loop.)

- Which bubble solution made the most bubbles at once?
- Which bubble solution made the biggest bubbles?
- Which bubble solution made bubbles that lasted the longest?
- Which bubble solution did you like using the most?

## Keep going!

Use the ingredients you have in different combinations to see if you can make something better than the three bubble solutions you just made. You can also try adding salt.

### More information on how bubbles are made



<https://www.exploratorium.edu/ronh/bubbles/soap.html>



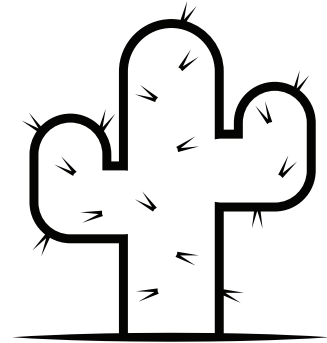
<https://sciencing.com/how-bubbles-made-4912993.html>

# Bubble Art

Are bubbles always round? If you have ever seen bubbles in soda or blown bubbles outside, you may have noticed that they have a round shape. However, bubbles can take other shapes too. When bubbles push up against each other or against another surface, they can have flat sides, like a hexagon. You can observe this by blowing lots of soap bubbles that stick together.

Before you start, you should have:

- 4 straws
- 4 small cups
- 2 cups water
- 4 tablespoons dish soap (Dawn or Joy works best)
- 4 colors of food coloring
- White paper



## Get started:

- 1.** Mix  $\frac{1}{2}$  cup water with 1 tablespoon dish soap in each cup. Add a few drops of different food coloring to each cup and mix.
- 2.** Using a straw, blow bubbles into the colored bubble mixture until the bubbles come slightly above the top of the cup.
- 3.** Lay a sheet of white paper across the top of the cup and lift the paper off after a second or two. The bubbles popping against the paper creates a pattern.
- 4.** Repeat with other colors.
- 5.** Let the paper dry.
- 6.** Look at your art and see the patterns the bubbles made on the paper. What kinds of shapes do you see?

## Keep going!

Try some different ways to make your bubble art. You can place the cup of bubbles and color on top of your paper and make bubbles until they overflow onto the paper or blow colored bubbles directly onto the paper.

## More information on bubble shapes

 [https://www.exploratorium.edu/ronh/bubbles/shape\\_of\\_bubbles.html](https://www.exploratorium.edu/ronh/bubbles/shape_of_bubbles.html)

 [https://www.exploratorium.edu/ronh/bubbles/bubble\\_meets\\_bubble.html](https://www.exploratorium.edu/ronh/bubbles/bubble_meets_bubble.html)

# Let's Play: Don't Pop the Bubble!

Why do soap bubbles pop? Soap bubbles pop when the film of soap is broken. It can be broken when the film dries out in the air, or when it lands on something like your finger or the pavement. Have you ever seen a bubble land on the ground and pop or pop as it is floating? Let's try to keep a bubble from popping!

Before you start, you should have:

- A balloon, inflatable beach ball or other light ball
- Space to move
- Optional: a partner

## Get started:

1. Stand in an open area with room to move.
2. Toss the balloon or ball in the air. This is the "bubble."
3. You must keep the bubble in the air. If it touches the ground, it "pops."
4. Keep count! How many times can you bounce the bubble before it pops?
5. Optional: Stand in an open area with a partner and bounce the bubble back and forth. See how many times you can bounce it before it falls.

## Keep going!

Stand opposite of a wall and bounce the bubble off the wall a few times. Then, step back a couple feet and try again. Keep going until you can't keep the "bubble" from falling to the ground!

Optional: Stand an arm's length apart from a partner. Toss the bubble back and forth. After two tosses, move back from your partner one step. Keep going and see how many steps away you can get before the bubble falls to the ground.

## More information on why bubbles pop

 <https://www.scientificamerican.com/article/can-you-catch-a-bubble/>

 <https://qz.com/737715/watch-bubbles-and-balloons-pop-at-10000-frames-per-second/>

 <http://www.bubbles.org/html/questions/pop.htm>