

# Bubble Prints

You can use bubbles to make art!



## What Do I Need?

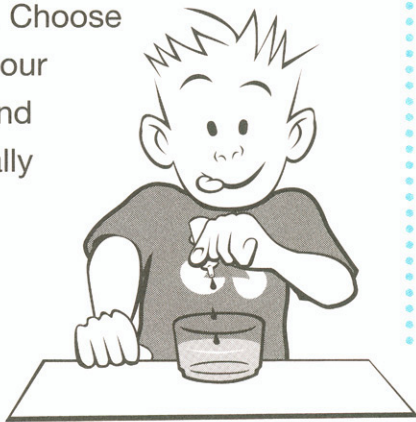
- newspaper
- bubble juice
- jars
- dish soap
- food coloring
- shallow bowl or pie tin
- straws
- paper

## What Do I Do?

**1** Put down a sheet of newspaper to keep your table clean.

**2** Pour about half a cup of bubble juice into a jar. Add two extra squirts of dish soap. Choose the color you want your Bubble Print to be and add three or four really good squirts of that food coloring.

**3** Swirl the liquid around in the jar until it's all mixed together, then pour about ½ inch into the shallow bowl.



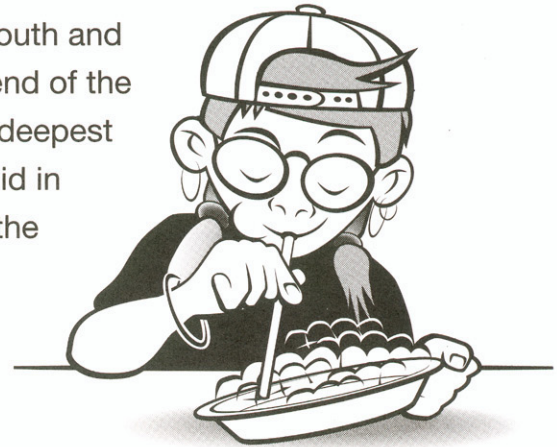
## Bubble Juice

1 gallon water  
¾ cup dishwashing soap

Mix all the ingredients together in a big bucket or dishpan. If you make your bubble juice the day before you want to use it, you'll get bigger, stronger bubbles, but it's pretty good right away, too.

**4** Put one end of a straw in your mouth and put the other end of the straw into the deepest part of the liquid in the bowl. (Tilt the bowl a little if you need to make a deeper part.)

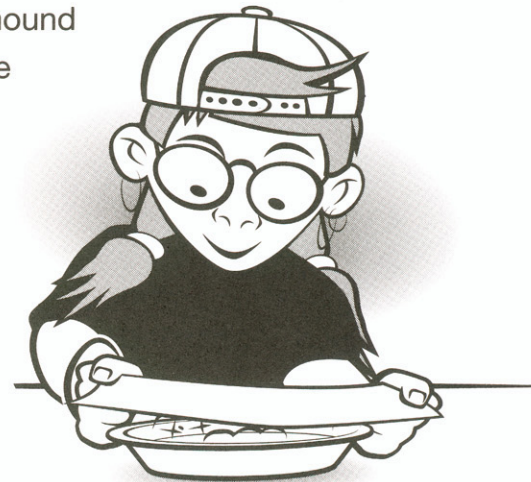
Blow a big mound of bubbles. *Don't* suck in, or you'll get a mouthful of soap. Yuck!



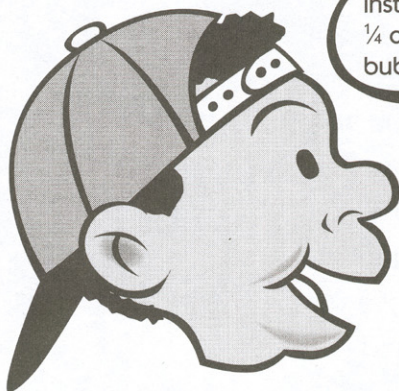
**5** Remove the straw and carefully lower a sheet of paper onto the mound of bubbles. Leave it for just a second, then lift it off.

(Be careful that the paper touches only the bubbles, not the liquid.)

**6** Let the paper dry, wet side up. (There may be bubbles on the paper, but don't worry. They'll pop as the paper dries.)



**7** When the paper is dry, look at the shapes the bubbles made. Are there circles? Squares? Triangles? You can cut out the bubble shapes and hang them up, or use the paper as stationery.



For brighter colors, use liquid tempera paint instead of food coloring. Mix  $\frac{1}{4}$  cup of paint with  $\frac{1}{2}$  cup of bubble juice.

**8** If you want two-tone Bubble Prints, pour your prepared bubble juice into two bowls. Add one color of food coloring to one bowl and the other color to the second bowl. Make a Bubble Print with one color, then use the same piece of paper to make a second Bubble Print with the other color.

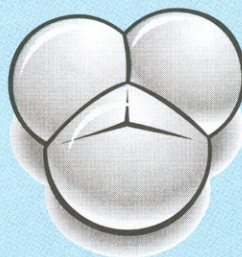
## What's Going On?

### What shapes can you find in your Bubble Prints?

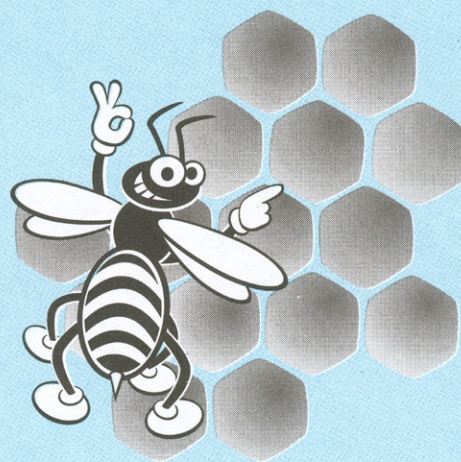
Free-floating bubbles are usually round. This is because a sphere is the shape that provides the most space for the air inside the bubble with the least stretching of the elastic soap film.

When a bubble lands on a wet surface (like your hand or the water in a dishpan), it uses that surface as one wall and contracts to make a dome. When two bubble domes touch, the bubbles join, making a wall between them. This common wall lets each bubble's soap film contract a little, shrinking the bubble's surface area. A bubble in a cluster with other bubbles makes use of neighboring bubbles to minimize its own surface area.

When you make Bubble Prints, take a look at how the soap films in the print meet. They'll tend to come together in three-way junctions, with angles of about 120 degrees between the soap films. Since this is an arrangement that lets each soap film have the smallest possible surface area, the bubbles pull on each other and slip and slide until they settle into this configuration.



Like the soap films in a cluster of bubbles, the wax walls in a honeycomb meet in groups of three, forming 120-degree angles. That's the shape that provides the most space for honey while using the least wax.



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