BUBBLE-OLOGY

Bubbles...they're slippery, shiny, and swirling with color! They float and they're so much fun. Take a closer look at bubbles and help kids learn about science!

Positively Science

Promote a positive attitude toward science by equating science with fun, and build your students' confidence in science skills. The study of bubbles involves principles of chemistry, experimenting with mixtures, surface tension, and adhesion. Something as simple as bubbles can teach your class about observation and experimentation—valuable skills that can be applied to science labs throughout the year.

Bubble-ologists in Training

Scientists have studied bubbles in search of new ideas to improve life. Nicotine bubbles have been used to help people stop smoking, and bubbles have been added to computers to improve memory. Tiny bubbles called liposomes have been filled with medicine and injected into the human body to treat diseases like cancer and flu, bike helmets have air bubbles for added strength, and bubbles have been added to fabrics to prevent clothing from shrinking after being laundered. What will be next? Challenge kids to think of new ways to use bubbles and provide training in using scientific skills by teaching kids the basic steps for tackling a problem. First...identify a problem and predict a solution. Next... test, experiment, and observe what happens during experimentation. Finally...draw a conclusion about what has been learned. Observation is the key. We look, smell, touch, and listen to learn from our senses. Let bubbles turn students into scientists-in-training...create a roomful of bubble-ologists!

What Is a Bubble?

There are many kinds of bubbles...everything from soap bubbles to package-wrap bubbles. A bubble is a ball of air or gas that is surrounded by a very thin layer of liquid or other covering. Bubbles float, adhere, or—most likely—pop! They last only until something touches the skin-like covering or the liquid in the covering evaporates. The reason bubbles pop so fast is that their "skin" is only one-millionth of an inch thick. They evaporate quickly or pop when they touch something dry, even something as tiny as a dust particle.

Bubbles last longer if they're covered with a soapy film. One famous bubble-ologist kept a bubble for 340 days by placing it in a tightly sealed jar and storing it in a basement away from the Sun. He discovered that the secret for keeping a bubble was keeping it away from dirt and sunlight.

Bubble Yum

One simple way to help kids understand the scientific approach to bubbles is with bubble gum. Everyone knows how to chew gum and blow a bubble, but show students how to be more scientific. Give each student a stick of bubble gum and ask him/her to make a bubble out of the gum—PROBLEM. Have students think about how they can create a bubble—PREDICT. Next, ask them to try different ways of making a bubble with the gum—EXPERIMENT and OBSERVE. Finally, have children decide what is the best way to make a bubble out of gum—CONCLUSION. Now ask students to blow a bubble, take the gum out of their mouth, and hold it in their hand. Explain that air was blown into a flattened piece of gum and a thin layer of gum covered the pocket

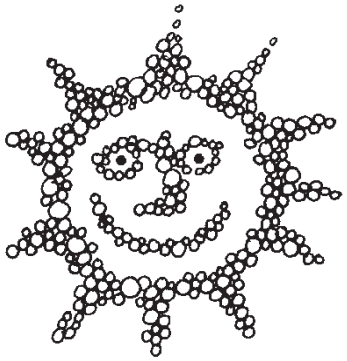
of air. This bubble, like others, will pop if the skin is too thin or if something touches it.

Bubble Wrap

Businesses often use something called bubble wrap to protect the contents of a package. Scientists learned that when bubbles of the same size are packed together, they connect at a certain angle and gain strength as a whole. Give kids a small piece of bubble wrap to examine and test the strength of the bubble wrap using the familiar egg drop experiment. Rinse out a milk carton, carefully open the top, and cut a piece of bubble wrap to fit inside. Place an egg, wrapped in bubble wrap, in the carton and tape it closed. Drop the carton from varying heights to see how well the bubble wrap protects the egg and have children observe the results.

Bubble Paint

Bubbles can even be found in paint. Further your bubble experimentation by combining bubbles and paint. Make bubble paint by mixing 1/2 cup of Ivory® soap flakes, 1/2 cup water, and tempera paint. The thick, frothy texture of this paint is perfect for depicting fluffy animals, clouds, and snow in pictures. The paint will stick to milk cartons, Styrofoam trays, and other plastic containers. As children paint a picture, remind them to observe the characteristics of bubbles. Then display the paintings with the title "Bubble Art!"

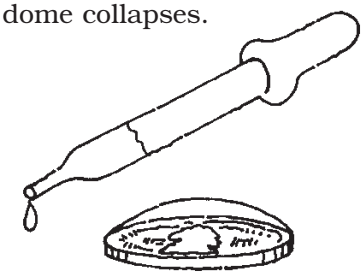


Bubble Labs

Try these six simple labs to help children learn about the basic steps of completing a science lab. A challenge is added to each lab to extend children's scientific testing skills.

1 WATER DROP LAB

This lab shows that water has high surface tension. Water droplets cling so well that they actually form a dome over a penny. Kids will be delighted to find that anywhere from 15 to 25 drops of water will cling together on the surface of the penny. Finally, when there is just too much water to hold, the dome collapses.



2 SOAP BUBBLE LAB

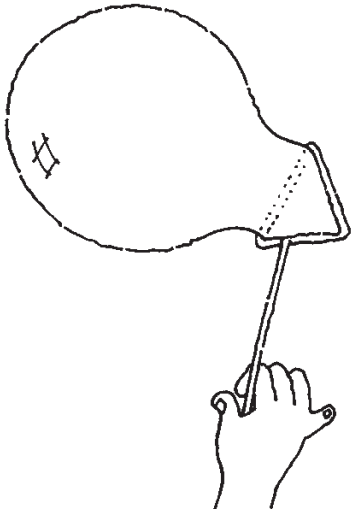
This lab demonstrates that adding soap to water makes water droplets loosen their hold on each other. It is then easier for air to get inside and stretch the soapy water into bubbles. Manufacturers of bubble solutions add glycerin to make bubbles last longer. Experiment with sugar and corn syrup to test different bubble solutions.

3 BUBBLE TECHNIQUE LAB

This lab shows children that the more slowly and evenly bubbles are blown, the larger the bubbles become. When air is passed through the wand quickly, as in waving or blowing hard, the bubbles are smaller and usually more plentiful.

4 BUBBLE SHAPES LAB

This lab demonstrates that bubbles tend to be round because the soap bubble skin is pulling inward while the air inside the bubble is pushing outward. It is possible, though, to make other bubble shapes. The secret is to keep the wand coated with the bubble solution and blow evenly on the full area of the wand.

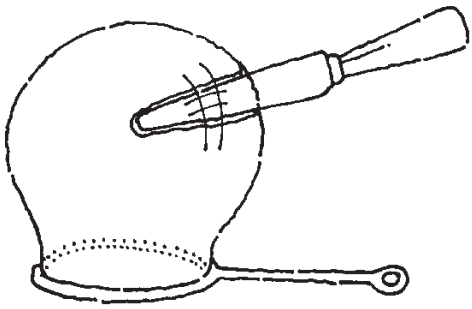


5 BUBBLE COLORS LAB

The rainbow colors seen in bubbles are the subject of this lab. These colors are the result of light reflecting off two different surfaces. The outer layer of soap is actually reflecting off the inner layer of soap. If you look carefully at a soap bubble just before it bursts, you will notice that all the colors disappear.

6 BUBBLE STRENGTH LAB

In this lab, kids will be surprised and delighted to discover that a knife or almost any object soaked in bubble solution will not burst a bubble. But, without the coating of the bubble solution, the bubble will burst.



Bubble Books

Find inspiration for more bubble fun through the following bubble books:

Soap Bubble Magic
by Seymour Simon
(Lathrop)

Bubbles: A Children's Museum Activity Book
by Bernie Zubrowski
(Little, Brown)

Pop! A Book About Bubbles
by Kimberly Brubaker Bradley
(HarperTrophy)

Bubble Festival
by Jacqueline Barber
(Dover)

Bubble Buddies

Choose a bubble buddy and try some of these bubble tricks:

DOUBLE BUBBLE

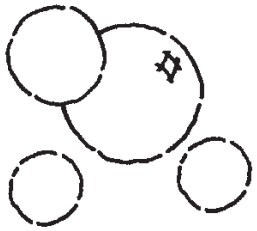
Each buddy blows a bubble and holds it on his/her wand. Combine the two bubbles without popping either one. Notice how the sides of the bubbles join together.

HANDY BUBBLE

Use your hands as a bubble wand. Shape them into a circle and dip them into the bubble solution until they are well coated. Raise your hands to your mouth and blow into the bubble film.

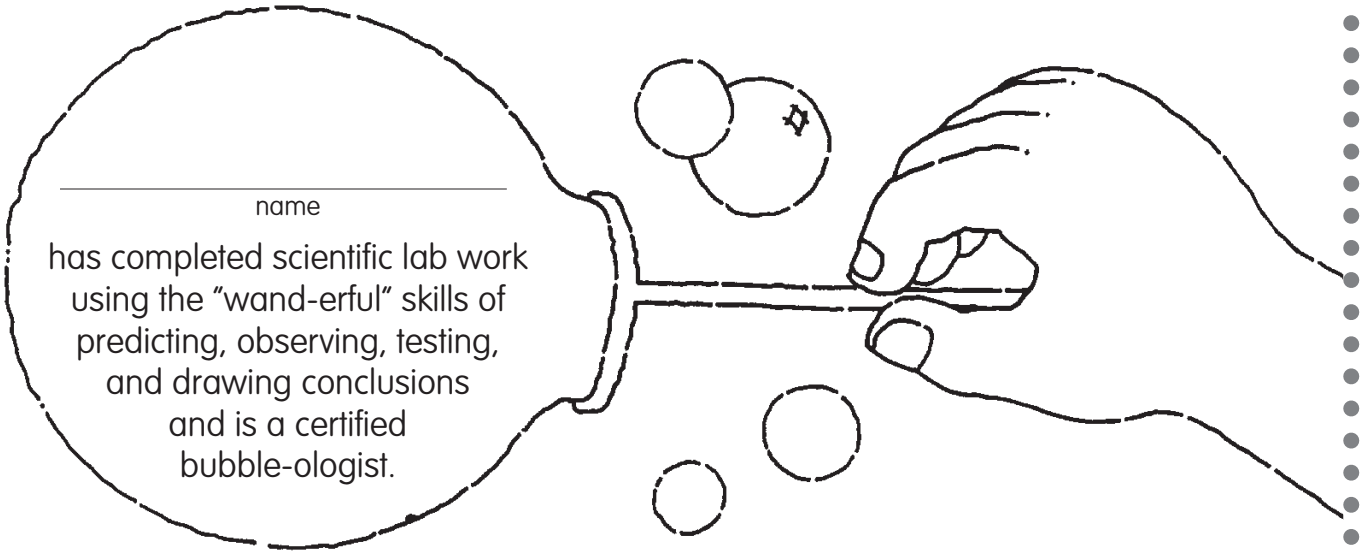
GIANT BUBBLES

You can make giant-sized bubbles if you have a kiddy pool and plenty of bubble solution. Pour the solution into the pool. Dip a hula hoop or a 6-foot circle of rope into the pool to coat it. Pull the giant wand out and let the wind pass through the film to create amazing bubbles.



Attach a wrapped piece of bubble gum to the award before presenting it to students.

CONGRATULATIONS!



_____
name

has completed scientific lab work using the "wand-erful" skills of predicting, observing, testing, and drawing conclusions and is a certified bubble-ologist.

_____ _____
teacher's name date

Bubble Lab 1: WATER DROPS

You'll need:
glass of water
eyedropper
penny
plastic lid

PROBLEM: Can you make water droplets stick together?

PREDICT: What do you think will happen? _____

TEST AND OBSERVE: Follow these steps and write down your observations:

1. Place a penny on the lid. Draw water into the eyedropper.
2. Drop one droplet of water at a time on top of the penny. Count the drops.
3. Keep adding drops. Watch to see what happens. _____

How many drops stuck to the penny before it all rolled off? _____

How did the drops of water look? _____

CONCLUSION: What did you learn? _____

_____

CHALLENGE: Add a drop or two of soapy water. What happens?

Bubble Lab 2: SOAP BUBBLES

You'll need:
glass of water
glass of soapy water
straw

PROBLEM: Do soap bubbles last longer than water bubbles?

PREDICT: What do you think will happen? _____

TEST AND OBSERVE: Follow these steps and write down your observations:

1. Blow air through the straw into a glass of water.

   What happens? _____

2. Blow air into a glass of soapy water.

   What happens? _____

CONCLUSION: What did you learn?_____

_____

CHALLENGE: How could you get soap bubbles to last even longer?

Bubble Lab 3: BUBBLE TECHNIQUE

You'll need:
bubble solution
bubble wand

PROBLEM: What is the best way to make a bubble?

PREDICT: What do you think will happen? _____

TEST AND OBSERVE: Follow these steps and write down your observations:

1. Dip the wand into the bubble solution and blow—soft, medium, then hard.

   What happens? _____

2. Dip the wand into the bubble solution and wave your arm.

   What happens? _____

CONCLUSION: What did you learn? _____

_____

Bubble Lab 4: BUBBLE SHAPES

You'll need:
bubble solution
twist ties

PROBLEM: Are bubbles always round?

PREDICT: What do you think will happen? _____

TEST AND OBSERVE: Follow these steps and write down your observations:

1. Attach twist ties to make a bubble wand in a different shape.
2. Dip the wand into the solution and blow. What happens? _____

   _____

CONCLUSION: What did you learn? _____

_____

CHALLENGE: Thread two straws onto a 3-foot length of string. Tie in a knot. Hold straws as handles and dip into bubble solution. Pull your arms up and see what shapes your bubbles will be.

Bubble Lab 5: BUBBLE COLORS

You'll need:
bubble solution
bubble wand
sunlight

PROBLEM: Are bubbles clear?

PREDICT: What do you think will happen? _____

TEST AND OBSERVE: Follow these steps and write down your observations:

1. Blow a bubble and catch it on the wand.
2. Hold the bubble up to the light. What do you see? _____

_____

CONCLUSION: What did you learn? _____

_____

CHALLENGE: What happens to the colors in a bubble just before it pops?

Bubble Lab 6: BUBBLE STRENGTH

You'll need:
bubble solution
bubble wand
plastic knife

PROBLEM: Can a bubble be poked by a knife without popping?

PREDICT: What do you think will happen? _____

TEST AND OBSERVE: Follow these steps and write down your observations:

1. Blow a bubble and catch it on the wand.
2. Have a friend dip a plastic knife in the bubble solution and then poke the knife into the bubble. What happens? _____

CONCLUSION: What did you learn? _____

_____

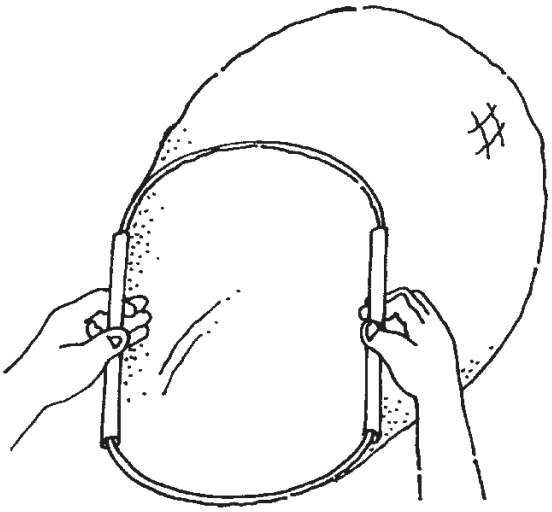
CHALLENGE: Try the test with a soapy pencil point. What happens?

Homemade Bubbles

Follow this simple recipe for the best bubbles ever…for yourself and all your friends. Make bubble wands out of twist ties, straws, string, slotted spoons, and clothes hangers, or invent your own ideas for special bubble wand shapes. Use your imagination! Have fun but remember to keep the bubble solution away from your eyes.

RECIPE FOR BEST BUBBLES EVER

clear dishwashing detergent
(Dawn®, Joy®, or Ajax®)
warm tap water
clean recycled gallon milk jug
2 tablespoons glycerin
(purchase at a pharmacy)
large Styrofoam meat trays



DIRECTIONS:
This is an outside activity!

1. Pour 2/3 cup dishwashing liquid into the clean milk jug.
2. Fill the jug nearly to the top with warm water.
3. Add 2 tablespoons glycerin to the mixture. You may need more.
4. Replace the cap and shake the jug gently. Let the solution sit awhile.
5. Pour the solution into the meat trays. Dip the wand into the solution and blow or wave the wand to make bubbles.

When you're through blowing bubbles, pour the solution back into the milk jug to be used again.