

Bubbalogna
K - 3
Teacher's Guide

California Content Standards
Kindergarten: Science 1a, 1b, 4b, 4e
Grade One: Science 1a, 1b, 4a, 4b, 4e
Grade Three: Science 1e, 1f, 1g, 5a, 5c, 5d, 5e

What's Going on?

The *Bubbalogna* exhibit encourages visitors to explore the principles and properties of the fascinating world of bubbles. The activities described in this guide introduce children to the properties of liquids as they compare plain water to bubble solution. The activities can get messy, so when working inside, use trays or shallow baking sheets as work surfaces and newspapers to soak up spills. Or, take the activities outside to a picnic table or other work surface that can handle spills.

Before You Visit CDM, rotate children through exploration stations designed to explore various properties of water – capillary action, sinking and floating, change of state, and taking the shape of its container. Older students can compare and contrast water to our Bubble Solution.

After Your Visit, challenge students to create their own Bubble Solutions and have fun finding many different ways to make a bubble.

Pre-Visit Activity
Properties of a Liquid

Objective: Children will learn the properties of liquids by exploring plain versus soapy water.

What You'll Need:

Water
Bubble solution (A bubble recipe is in the **After Your Visit** section.)
2 plastic pitchers (small enough for children to pour from)
Tub
4 – 6 plastic containers of varying sizes and shapes
1/2 " x 4" strips of paper (at least one per child)
Chalk
Sponge
Paper clip
Cork
Ball of clay
Ice cubes (at least one per child) – some made with plain water, some made with soapy water
Plastic sandwich bags (at least one per child)
Tray
Small spray bottles
Salt water
Stopwatches
Student Recording Sheets A, B, C, D – one copy of each per student

Procedure:

1. Prior to the lesson, set up exploration stations in the room. These stations will help children explore the changing shape of a liquid, capillary action, sinking and floating, and change of state.:

- K –
 - Station 1 – small pitcher of water + different sized containers to pour water into (liquids can change their shape)
 - Station 2 – small pitcher of water + strips of paper (capillary action)
 - Station 3 – tub of water + chalk, sponge, paper clip, cork, clay (sink or float)
 - Station 4 – plastic sandwich bags of ice set in a tray + small spray bottles of salt water (at least 1 per child) (melting, change of state)
 Children will rotate through the different stations to learn different properties of liquids.
 - 1 – Same stations as Kindergarten, but instead of just plain water, place plain water and the Bubble Solution at each station. – For example, compare and contrast plain water and soapy water.
 - 3 – Each station has plain water, Bubble Solution, and all of the experimental tools. Instead of switching stations, children stay at one to carry out their own investigations. (Some possible investigations are: How quickly does the same object sink through each substance? Which substance evaporates the quickest? Which liquid is the heaviest? The lightest? Which liquids travel up a piece of paper (capillary action)? How quickly does each liquid move?) You may want to have children brainstorm a list of questions they have about the liquids and record them on chart paper to give the children a starting point. Help children determine a method of recording their results.
2. Gather the children in an area of the room. Ask them what they know about liquids (or in the case of Kindergarten – what they know about water). Chart their responses.
 3. Tell the children that they are going to have a chance to explore the properties of a liquid. Explain the exploration station process. With the exception of third grade, where each student remains at a single station, children will rotate through the stations, recording their observations about liquids. (Handle the rotation in a way that is comfortable for you and your students. You may want to assign a station to students and have them stay there for a specified amount of time. You may want self-directed students to rotate through the stations at their own pace.)
 4. Give children ample time at the exploration stations.
 5. Gather children back together. Review the chart you made previously about the properties of liquids. Make changes and additions to the chart based on the children's explorations.
 - 1 – Ask children for hypotheses on what the “other” substance is.
 - 3 – Individual children may want to present their experiments and the results.

Assessment:

Talk to children as they are working. Do children know the properties of liquids?

Extensions:

- Going through the activity multiple times and allowing plenty of time for exploration allows children to build on their learning. They are able to observe other children and combine what they see with their own explorations to problem solve and create something new. Repeating the same activity several times will give children new understandings. Third graders may want to explore a new question or test the reliability of a classmate's experiment.

During the Visit Activity
More Properties of Liquids

Materials:

Hands, eyes, and brains

Procedure:

Challenge children to discover the many different properties of soapy water as they play in the exhibit. You or parent chaperones may choose to use the following discussion topics as you and your class travel through the exhibit:

How many different ways can you make a bubble? (blowing air through a tube, waving a wand, stretching a film out of a tub, displacing water with air)

What causes the bubbles to form a sphere? Can you make a square bubble? (the water in the bubble will attempt to form a shape with the least amount of surface area – a sphere)

What is iridescence and what causes it? (Iridescence occurs when an object (like a soap bubble) appears to change color depending on the angle at which you view it. It is caused by light waves reflecting off a multi-layered surface.)

What happens if you blow on a bubble?

How big can you make your bubble? How small?

Can you touch your bubble without breaking it? (Bubbles pop when they are dry. If you wet your hands in the soapy solution, you can handle a bubble without popping it.)

Post Visit Activity

Creating Your Own Bubble Solution

Objective: Children will use what they learned about the properties of liquids to create the perfect bubble solution.

Materials:

Clean buckets or tubs

Spoons

Joy dish detergent

Glycerin

Sand

Baby oil

Linseed/flaxseed oil

Vinegar

Salt

Vegetable oil

Measuring cups and spoons

Bubble wands – use traditional wands as well as strawberry baskets, bent wire, straws, pipe cleaners (bent into shapes), slotted spoons/spatulas, paper cups with the bottom circles cut out, Funnels

Paper clips

Plastic cups

Bubble Recipe

You need: 1 clean bucket

1/4 cup Joy dishwashing detergent

1 TBSP glycerin (optional)

2 1/2 cups water

1. Measure water into the bucket
2. Add dishwashing detergent to the water
3. Add the glycerin
4. Stir, but not too much. You don't want froth.

Procedure:

1. K – Make the recipe in small groups and then have fun trying to make different kinds of bubbles.
1 – Have the children make the bubble solution, but omit the glycerin. (You may also want to make the bubble solution without the glycerin ahead of time.) Pose this question to the children: What can we add to the bubble solution to make better bubbles?
Give each child or group of children 4 small cups with bubble solution. Have them go to one of the exploration stations where there are measuring spoons and glycerin, sand, baby oil, and linseed/ flaxseed oil. Challenge the children to add one new item to each of their 4 small cups and then test their recipe to create the best bubble solution. Remind them to keep track of their recipes so that the best bubble solution can be recreated. If you are worried about a possible mess, you may want to do this activity outside.
3 – Have the materials set out at the exploration stations. Challenge the children to use what they have learned about different liquids to create a bubble solution. Remind them to keep track of their recipes so that the best bubble solution can be recreated.
Give children ample time to experiment and explore.
2. Call the children back together as a group. Discuss, test, and recreate the “best” bubble solution as a group.

Assessment:

Are children able to use prior knowledge from the pre-visit experiments and the museum visit to inform their decisions about making bubble solution?

Extensions:

- Write nonfiction and fiction about bubbles.

[CDM Exhibit Page](#)

Related CDM Lesson Plans:

[Alice's Wonderland: Incognito Ink](#)

[Alice's Wonderland: Slippery, Slurpy, Taste Sensations](#)

[Bubbalogna: Bubble Domes](#)

[Bubbalogna: Impressionist Bubbles](#)

[Magic Schoolbus: Deicing with Salt](#)

[Magic Schoolbus: Make a Giant Snowflake](#)

Additional reading for children:

[Pop! A Book About Bubbles](#), by Kimberly Brubaker Bradley

Bubbalogna
Student Recording Sheet A
What is the shape of your liquid?

Draw each container carefully. Draw a line to show how high the water fills each container.

Name _____

Bubbalogna
Student Recording Sheet B
Which liquids travel up a piece of paper (capillary action)?

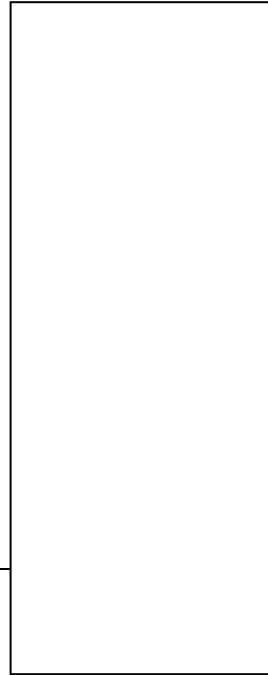
Draw how far each liquid traveled up the paper. Label your drawings.

Name _____

Liquid Name _____



Liquid Name _____



**Bubbalogna
Student Sheet C
Float or Sink?**

Complete the chart by drawing or writing the name of each object you use. Write F for "Floats" or S for "Sinks."

Name _____

Object	Water	Bubble Solution

**Bubbalogna
Student Sheet D**

How does the ice cube change? What are the different forms of water?

In the first box, draw the ice cube. In the second box, draw how the ice cube changed after you sprayed it with salt water.

Name _____

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