

BUBBLE TROUBLE

Extending “Bubble Trouble” In Your Classroom

This study guide is meant to build on the enthusiasm and curiosity of your students about bubbles after watching or participating in the “Bubble Trouble” presentation.

These activities are fun and engaging and can act as an introduction to the scientific principles they demonstrate.

Meets
Next Generation
Science
Standards

**CHOOSE
BUBBLE
MUSIC TO
ACCOMPANY
CLASS AS
THEY BLOW
BUBBLES AND
EXPERIMENT...**



Some suggestions for music:

- Waltzes
- Rock songs such as “Rock the World” by the Bubbles
- Or wistful, slow-moving songs such as: “I’m Forever Blowing Bubbles”



Bubble Trouble

How can we prove that the skin of a bubble can stretch? Qualities of Solutions

Start by eliciting student suggestions of proofs. Form small groups of students to test these proofs. If you wish to demonstrate a proof, try the following:

PROCESS: Mix Bubble Mix at right. Blow a bubble with a wet straw onto a wet table. Draw a circle around the bubble and measure the diameter. Then carefully put the wet straw inside the bubble and blow a bubble inside the bubble. Measure again to show that the outer bubble is now bigger.

Repeat with bubbles within bubbles. Elicit from students that the skin of the outer bubble keeps stretching. Ask why the skin is stretching (each bubble adds more air).

An alternative method: A wet hand inside a bubble will also stretch the skin.

What Can Float on Water? Surface Tension and Cohesion of Water

PROCESS: Use this experiment for demonstrating the property of surface tension in water. Tell students that you will show how to create a “skin” on the surface of water. The skin is a film that will allow something that is heavier than water to float on top of the water.

1) Ask: “Do you think this paper clip will float on the water?” Drop paper clip in and ask why it sank. (The metal clip is denser than the water.)

2) Place a piece of absorbent paper on the water. It should be slightly bigger than the paper clip. Next, place a paper clip on the paper. Within a minute or two, the paper towel will sink to the bottom of the glass, but the clip will float on the water.

3) Ask students to explain why the denser clip can float on the less dense water. Explain that the strong electrical attractions between water molecules creates a kind of “skin” on the

Bubble Mix

Plastic container that holds about 30 ounces

4 six-ounce cups of water:
can use six ounce plastic drink cups to measure

½ cup of dish soap

1 tsp. of glycerin

Plastic spoon

Drinking straws

Table or flat surface



Surface Tension Materials

water in a glass

paper clips

paper napkin or towel

liquid dish soap

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surface of the water. The “skin” is a dense film that can support the paper clip.

4) Squeeze a small drop of dish soap into the water. The soap will break up the surface tension of the water molecules. The paper clip will then sink because the water now has less density.

Challenge students to find other materials that float on water. (Ice cubes are an example.)

Why Is That Balloon Blowing Up By Itself? Creating a Chemical Reaction That Produces Bubbles of Carbon Dioxide.

PROCESS:

1) Ask: Can a balloon blow up without someone putting air into it?”

Demonstrate by inserting the bottom tube of a funnel into the opening of the balloon. Stretch the balloon if needed.

2) Put the yeast and sugar through the funnel into the balloon. Pour warm water through the funnel and then remove the funnel from balloon. Tie a knot to keep the yeast, sugar, and water mixture inside the balloon. Measure the balloon.

3) Put the balloon in a warm spot. Wait and watch while it keeps expanding. Measure the balloon when it is fully expanded.

4) Challenge students to explain what happened. You might give them the hint that a chemical reaction with bubbles is involved. The explanation is that the yeast uses the sugar and water to grow inside the balloon. As the yeast expands, it gives off bubbles of carbon dioxide. The bubbles burst and fill the balloon with the gas.

Materials

balloons

narrow funnel

measuring spoons and cups

warm water

one teaspoon active dry yeast

one teaspoon sugar

tape measure



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How Can We Make Fog In a Jar?

Tell students that fog is actually a cloud made up of tiny droplets of water suspended in air. Ask: How does fog form?

This experiment will show how this happens.

PROCESS:

- 1) Tape the black paper around the bottom half of the jar.
- 2) Fill the jar to the top with hot tap water. Let it heat the jar for a minute. Then pour out twothirds of the water.
- 3) Light the match and hold it over the jar opening. Wait several seconds. Then drop the match into the jar and quickly cover the top of the jar with the bag of ice.
- 4) Ask students to observe the fog as it forms. If this does not happen, repeat the actions in step 3. Have students share their observations as they watch the fog form, next, separate into water droplets that adhere to the glass, then collect into water drops that run down the inside of the glass jar.
- 5) Ask: Why does the fog form inside the jar?

Explain that the air inside the jar becomes warm and wet. The air rises to the top of the jar where it is cooled by the ice cubes. When warm, wet air meets cold, wet air, they create a fog of small, light water droplets.

6) Ask: Why do the water droplets adhere or cling to the glass inside the jar?

Explain that the water droplets have the property of clinging to each other. They move together and become heavier. This property is called cohesion. The heavier water drops also have the property of clinging to other material. This property is called adhesion. The water drops adhere to the glass. Then, as the drops get heavier, they run down the side of the glass jar.

Materials

glass jar

black paper to wrap around jar

hot water

matches

plastic bag of ice cubes



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Research & Creative Arts Projects:

- Have students work individually or in small groups to do any of these projects or another suitable one of their own design.
- Make a video of students
- Demonstrating and discussing any of the experiments above!
- Construct a three dimensional model of the molecular structure of water as a gas, liquid, and solid.
- Use creative movement to express the different forms of water: fog, cloud, liquid water, ice and how one changes to another.
- Create a rap song or hip-hop dance about bubbles, fog, or water and its properties.



DANCE WITH BUBBLES!



Activities support the following standards for new york schools:

- *Grades 3-4 Early Elementary Standards*
- *Demonstrate ways of moving in relation to people and environment.*
- *Theater and Dance*
- *Kinetic energy - Present different forms of movement energy - work as a group*
- *Middle School standards (Gr 5)-Use language, voice, gesture, movement and observation to express their experience and communicate ideas and feelings*
- *Next Generation Science Core Ideas*
- *PS1: Matter and Its Interactions;*
- *PS1.A Structure and Properties of Matter*
- *PS1.B Chemical Reactions*
- *PS2: Motion and Stability: Forces and Interactions*
- *PS2.A: Forces and Motion;*
- *PS2.B: Types of Interactions*

**Check the line
breaks to be sure
we got this right?**