



IMPORTANT:

Read all instructions before proceeding

SOAP, FILM, AND BUBBLES

OVERVIEW: This presentation consists of five small experiments

OBJECTIVE: Students will explore soapy water films, soap bubbles, and soap and water characteristics.

GRADE LEVEL: K-3

OHIO STANDARDS:

This kit is mainly used for Scientific inquiry

TIME: 30-45 minutes

MATERIALS: (per group of 3-4 students)

- *Shallow aluminum pan
- *Soap solution (1 tsp. Dawn or Joy in water)
- *Straws
- *String
- *6 bottles of bubble solution with plastic blower ring
- * Paper, wool, wax paper, book
- *Objects with openings (cookie cutters, templates)
- *Styrofoam cup
- *Water

INTRODUCTION:

The presenter might want to include a brief dialogue on the subject of water and soapy water. Possible topics include composition and nature of water and soap, the cleaning process, and uses of soap. Give a brief overview of experiments.

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ADAPTED FROM:

"Soap Films and Bubbles", pp. 7-17,

AIMS Education Foundation, 1990

ACTIVITY 1: Wet Your Appetite

OBJECTIVE:

To explore soapy water films and to let students “play” to get them interested.

GRADE LEVEL: K-3

VOCABULARY: Film

MATERIALS: (Per group of 3-4 students)

- *Shallow aluminum pan
- *Soap solution (1 tsp. Dawn or Joy in water)
- *Straws
- *String
- *Bubble blow

GETTING READY:

1. Cut straws in two equal pieces.
2. Cut string into 15-20” sections.

PROCEDURE:

1. Thread string through straw pieces and tie to create a frame for making a soap film.
2. Students submerge frame into pan filled with soap solution and pull out slowly. A soap film is created and can be manipulated.
3. Encourage students to study the film and to make different shapes with the string/straw frame.

DISCUSSIONG:

1. What colors were seen in the film?
2. Could you put your finger through the film?
3. Did the film’s shape change with respect to the frame’s shape?
4. Describe the film

ACTIVITY 2: It's a Touchy Subject

OBJECTIVE:

To determine what surfaces are “bubble friendly”.

GRADE LEVEL: K-3

MATERIALS: (Per group of 3-4 students)

- *6 containers of bubble solution and blowers
- *A variety of surfaces such as:: Paper, wool, wax paper, book
- *Bubble friendly or not document

GETTING READY:

1. Make a chart to record “bubble friendly” surfaces. Or have a copy of the Bubble Friendly or Not document

PROCEDURE:

1. Students blow bubbles and let them land on different surfaces to see if the bubble pops or not.
2. Students record which surfaces are “bubble friendly.”

DISCUSSIONG:

1. Which surfaces are “bubble friendly?”
2. Do all groups agree? What could have caused the differences? (A surface became wet with repeated trials, wind conditions, etc.)
3. Why are some surfaces “bubble-friendly” and others are not? (Compare and contrast surfaces).
4. Why do bubbles pop on paper and not on wool?
5. What did you learn about friendly surfaces? (bubbles like wet surfaces and certain dry ones.)

Bubble Friendly or Not?

Directions: Put an **X** in the if the item is bubble friendly

Paper	Paper Towel	Cloth Towel	Wax Paper	Book	Skin	Plastic	

How many items were bubble friendly? _____

How many items were not bubble friendly? _____

Which items were bubble friendly?

Why?



ACTIVITY 3: TAKING SHAPE

OBJECTIVE:

To explore how bubbles are formed

GRADE LEVEL: K-3

MATERIALS: (Per group of 3-4 students)

- *6 containers of bubble solution and blowers
- * Different objects with openings for blowing bubbles

PROCEDURE:

1. Students dip these non-traditional items into the soap and blow through the soapy film created to create a bubble.
2. Encourage students to watch the formation of the bubble and be able to describe it.

DISCUSSIONG:

1. What shape was the bubble as it initially formed? (The shape of the hole).
2. What shape did the bubble finally form? (sphere)
3. Why? (Stability)

ACTIVITY 4: BUBBLE CLUSTERS

OBJECTIVE:

To explore how bubbles join together

GRADE LEVEL: K-3

VOCABULARY: Angle

MATERIALS: (Per group of 3-4 students)

- *Shallow aluminum pan
- *Soap solution (bubble solution)
- *Straws

PROCEDURE:

1. Students dip straws into soap water.
2. Hold end of straw about 1" above the soap water and gently blow a bubble in the pan
3. Repeat
4. Students observe how many different ways bubbles can join, how 4 bubbles join, etc. Students also should observe how the bubbles join together.
5. Draw the different ways the bubbles form on the board.
- 6.

DISCUSSION:

1. At what angle do 3 bubbles form? (120 degrees)
2. Why? (most stable)

ACTIVITY 5: WATER RINGS OR DROPS ON A PENNEY

OBJECTIVE:

To explore the surface tension of water

GRADE LEVEL: K-3

VOCABULARY: Surface tension, sphere

MATERIALS: (Per group of 3-4 students)

- *Cup of water
- *2 pipettes (one for soapy bubbles and other for water)
- *Penney
- *Straws
- *Waxed Paper
- *Bubble blow
- *Piece of paper (1/2" x 1/2")

PROCEDURE:

1. Students make drops of water with pipette on wax paper. Then they look at the bubbles from the side (Putting their head on the edge of the desk) to notice the shape of the bubble formed. You can also do the Drops on a Penney lab here.
2. Repeat with soapy water bubbles. (Do not contaminate the liquids)
3. Place piece of paper in cup of water. Dip finger in soap and then touch water next to the paper. The paper should "jump" away. This won't work if there is any soap in the water.

DISCUSSIONG:

1. Why were small water drops like half spheres and soapy water drops flat? (Water has more surface tension).
2. Why were larger water drops less spherical? (Force of gravity overcomes surface tension).
3. Why did paper jump away from soap? (Soap lowered surface tension in the vicinity and the paper was "pulled" by the higher surface tension, clean water, on the other side of the paper).



Steps to the Scientific Method

- *Ask a Question**
- *Do Background Research**
- *Construct a Hypothesis**
- *Test Your Hypothesis by Doing an Experiment**
- *Analyze Your Data and Draw a Conclusion**
- *Communicate Your Results**

Directions: Use an eye dropper to place drops of WATER on the penny one at a time until ANY amount of water runs over the edge of the penny.

Make a hypothesis (guess) about the number of drops your penny will hold. My guess is _____

Record the number of drops in the boxes below.

Trial 1	Trial 2	Trial 3