

**Module #1 Ask**
**Lesson #9**

**Background Information:** "There is much more to the common bubble than one might think. Consider the applications of surface tension, which can range from the understanding of the atomic nucleus to theories of the planetary system. The form of bubbles and their demonstration of the laws of physics often goes unnoticed by the unlearned eye, but for those that are willing to seriously observe these spheres, it will become apparent that blowing bubbles is not mere child's play. If one gazes into a bubble, you will see contrasting colors and reflections, which can be quite mesmerizing."

Blowing a bubble inside of another bubble is not as easy as it sounds either. As you blow the bubble inside the first bubble you are pushing out against the surface of the first bubble. When blowing a bubble inside of another bubble it is best to go slow to go fast-in other words, take your time and end up with a better result. Some experts suggest that you do not remove the straw from the solution of the first bubble but that you simply begin another bubble. Others suggest that you blow one bubble and then gently move the straw into position for the second bubble. Today youth will be trying out both methods and determining which works best for them."

Grade Level: <b>Elementary</b>	<b>Focus:</b> Using all of your senses, primarily visual and touch.	<b>Supplies &amp; Materials</b>	<b>Preparation</b>
		<ul style="list-style-type: none"> <li>• Butcher paper</li> <li>• Chart paper</li> <li>• Markers</li> <li>• ½ Composition Book or paper folder</li> <li>• Straws</li> <li>• Dawn Detergent</li> <li>• Karo syrup or glycerin</li> <li>• Bucket</li> <li>• Paper plates</li> <li>• Rulers</li> </ul>	<ul style="list-style-type: none"> <li>• Review entire lesson plan</li> <li>• Prepare the bubble solution in advance.</li> </ul>

**Objective:** Children apply the skills of observation utilizing the five senses to learn about bubbles.

**Introduction:**
**Prior Knowledge: Ask children the following questions.**

1. What have you learned about observation? (Make a list)
2. What does it mean to persist?
3. When is a time that you were persistent?
4. Share with youth that sticking to something, even when it isn't working ultimately leads to success—not because you keep doing things the same way, but because as you practice you make adjustments so things work more effectively.
5. Ask youth why persistence is so important for people to develop? Explain today's lesson will require them to persist as it won't be easy.

**Build Vocabulary Knowledge: Words to describe bubbles**

**Observation:** using all of your sense to notice what is going on in the world around you

**Surface Tension:** the tension of the surface film of a liquid caused by the attraction of the particles in the surface layer by the bulk of the liquid, which tends to minimize surface area. In bubbles the thin layer of water in between the two layers of soap molecules is what helps make a bubble a sphere.

**Persistence:** sticking to something and keep working to find a solution

**Lesson:** During this part children will engage in hands-on, minds-on, collaborative work to promote critical thinking.

### Bubbles Inside of Bubbles

#### What you will need:

- Bubble solution
- Straws (one for each youth)
- Flat surface (cover with garbage bag to ensure that it is smooth)

#### What you will do:

1. Divide youth into pairs or groups of three
2. Explain that there are two identified ways to make bubbles inside of other bubbles. Here is the first way.
3. Practice blowing **BIG** Bubbles.
4. Practice blowing tiny bubbles. Use a bendy straw. Dip the end of the straw in the bubble solution and blow through the other end.
5. Blow the biggest bubble you can. Put it on a wet surface where it will not be disturbed.
6. Take your straw and dip it in the bubble soap. Slowly put the bubble solution-covered end inside of the giant bubble and blow
7. Be patient. Practice makes perfect. Don't be judgmental about the size of your giant bubble. If your giant bubble moves too much while you're blowing little bubbles inside of it, **STOP**. Wait a second and then gently blow again. Stop at the point where you think it might pop.

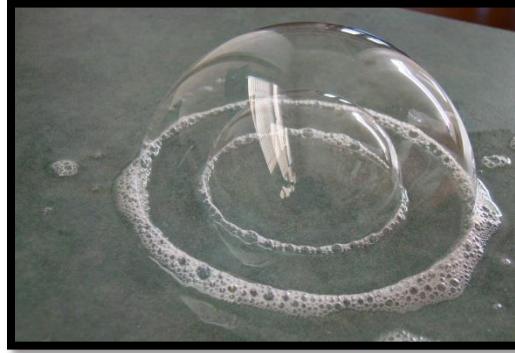
#### Here is the second way:

8. Put a spoonful of bubble mixture onto a tray or flat surface.
9. Put a straw into the bubble mixture and blow through it gently to make a dome shaped bubble.
10. Blow again to make another dome shaped bubble inside your original one. Now you've got a double bubble!
11. See if you can add even more bubbles inside your double bubble. How many can you make?



This is a picture of the World Record, 71 bubbles inside another bubble. Record was set April 20, 2011.

This picture is more normal.



12. While youth are working on the Bubble Art ask the following open-ended questions:
  - a. What have you observed?
  - b. Which of your senses are you using?
  - c. What other senses might you use?
  - d. Why do you think what you have observed is happening?
  - e. What is the best way to blow so they don't pop too soon?
  - f. What is the best way to blow multiple little bubbles at one time?
  - g. What advice would you give to other bubble blowers in order for them to be more successful?
13. When youth have finished blowing bubbles inside one another, consider which strategy works most consistently for you. Share that information with another youth.
14. When youth have finished, ask them to clean up and join the group either in a circle or at desks.
15. Move on to the closing questions and writing activity.

**Closing:** During this part of the lesson you will reconnect with the objective.

**Review:** Recap what we did today. Ask the question: What did we do today? What new words did we discuss today? (record the responses)

**Reflect:** Think about what was learned. **Ask:** What were some strategies you used to blow bubbles inside of other bubbles? (record the responses in bullet points) Did you find this challenging? If you did, what did you do to overcome the challenge? How can learning how to overcome challenges help you in the future?

**Debrief:** Consider how what you learned today can be used tomorrow in school and in your life. **Ask:** How might you use what you learned today tomorrow in school? (record the answers)

How might you use what you learned today at home? (record the answers)

How does sticking to blowing a bubble inside of another bubble help you develop the habit of persistence?

**Write:** With your partner write 2 things you learned today that can be generalized to your life (i.e. I learned that being patient was really important), 1 thing you would like to try again, and 1 question you have.

### Bubble Recipe

1 gallon water

1 c. Dawn Dishwashing Liquid

2 tablespoons Karo Corn Syrup or glycerin (you can purchase glycerin at Wal Mart)

### Directions:

- Mix in the bucket stirring gently to avoid creating foam.



- The solution will keep for several weeks and seems to improve with age, so don't worry if you have some left over
- Distribute to youth in the small food storage containers after sealing with the lid