

Bubble Trouble

Grade: 1-2

Time: 30+min

Activity Overview :

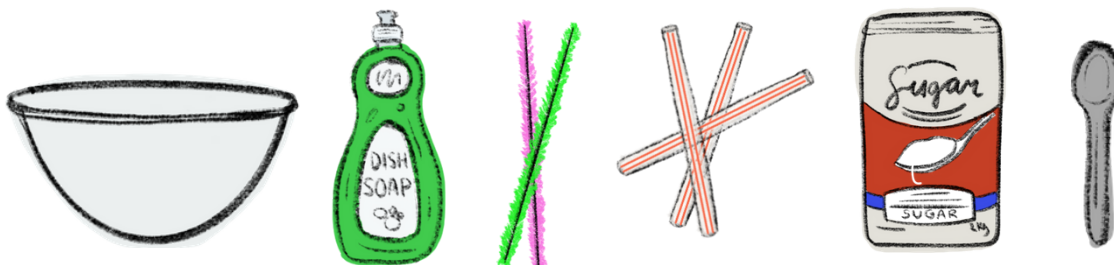
Today we are going to learn about surface tension while blowing bubbles! We will be making bubble wands of different shapes to see if we can make our bubbles all different shapes. We will also try to hold a bubble with our hands.

Before we begin think about the following questions:

- What shapes are bubbles?
- Do you think you can make a square bubble? Why?
- Have you ever held a bubble before?
- Do you think you could hold a bubble? Why?

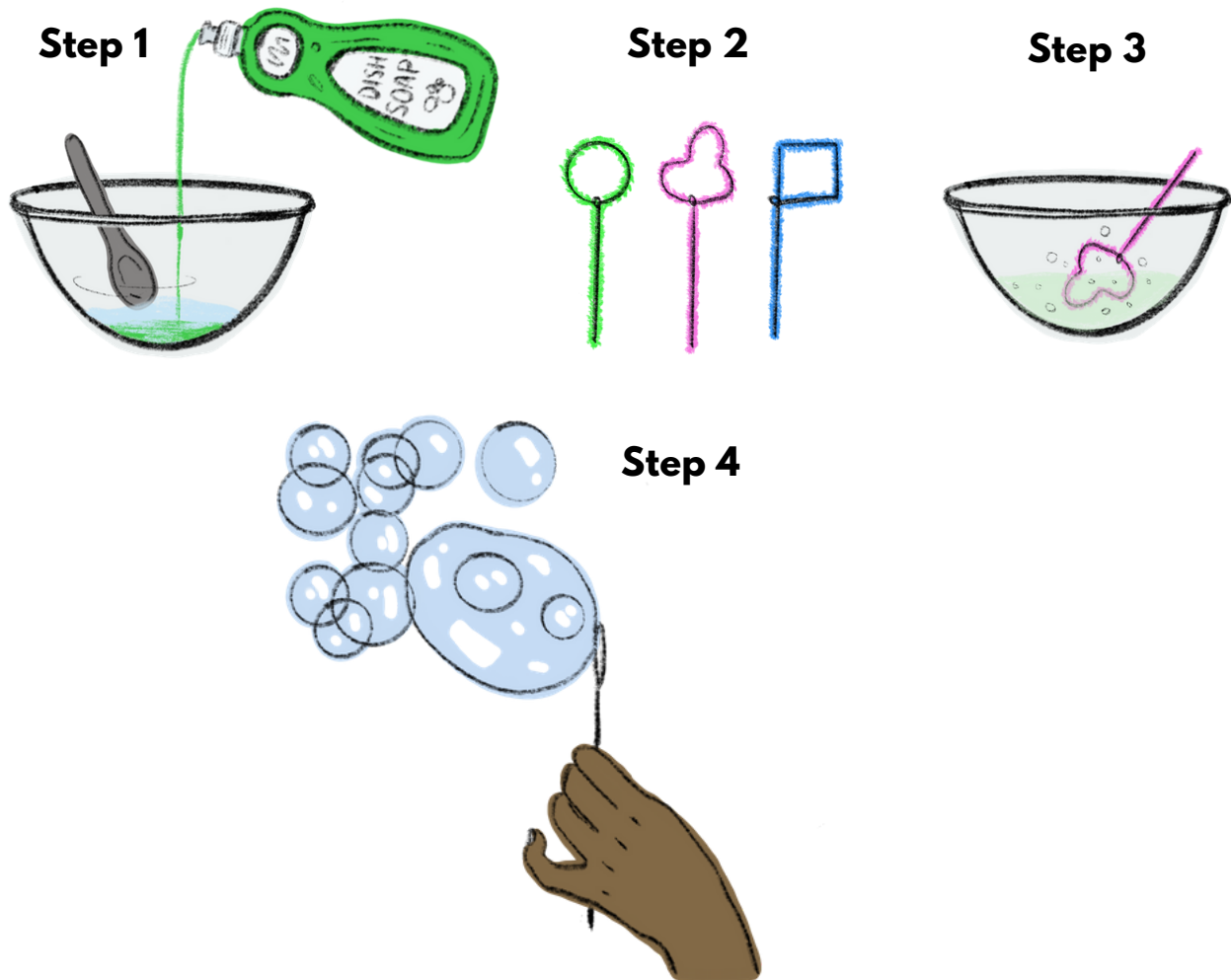
Materials:

- 1 cup of water
- 2 tbsps of dish soap
- 1 container/bowl to put mixture in
- 1 cup of water
- 1 tbsp of sugar
- Spoon
- 2 tbsps of dish soap
- 3 pipe cleaners
- 1 straw
- 1 container/bowl to put mixture in
- Flat surface to blow bubbles on (like a table)



Activity:

- 1 Mix water and dish soap together in the bowl/container.
- 2 Bend each of the pipe cleaners to make different shapes
 - a. Try making a circle, square and triangle
 - b. Make sure to leave some pipe cleaner for you to hold onto
- 3 Go outside with your bubble wands and bubble solution or a place where it's okay to blow bubbles.
- 4 Dip one of your wands into the bubble solution.
- 5 Take it out and blow on your bubble wand so it makes a bubble.
- 6 Repeat steps 4 and 5 with each wand
 - a. What shapes were the bubbles?
 - b. Did they match the shape of the wand?



Engineering and Science Connections

Why are bubbles round?

Surface Tension is the force that keeps molecules together. If something has a high surface tension, the molecules pull each other together a lot.

Water has a high surface tension. Think of it like you and a group of friends all giving each other a big hug. The molecules in water want to stay close together.

Our bubble solution has a lower surface tension. This is like if you and your friends were holding hands in a big circle. The molecules still stay connected, but like to spread out more.

Bubbles always end up in a round shape because the molecules like to spread out as far as possible; just like if you and your friends tried to spread out while holding hands, you would end up in a big circle.

Why do Bubbles Pop?

Objects around us can be **hydrophilic** or **hydrophobic**. Hydrophilic means that water likes the objects, and hydrophobic means that water doesn't like them.

When our hands are dry, they are hydrophilic, so the water molecules like to touch our hands.

In a bubble they are water molecules. This means that if a bubble touches our dry hands, the water doesn't want to stay in the bubble anymore, it would rather be on our hand, so the bubble pops.

If our hands are covered in the bubble solution, they are hydrophobic. The water doesn't want to touch our hands anymore, so the bubble pops.

Extensions

Try making your bubble wands different sizes:

To make your bubble wands bigger try using 2 pipe cleaners to make the shape bigger
- Does the size of your bubbles change?

Try holding onto your bubbles:

1. First blow a bubble with your bubble wand
2. Put out your hand and try to have the bubble land on your hand
 - a. The bubble will pop
3. Try covering your hand in your bubble solution
4. Repeat steps 1 and 2
 - a. Remember to be gentle with the bubble, it can still pop, if you touch it too hard!

Try playing a game of bubble keep up:

Cover your hands in your bubble solution and see how long you can keep the bubble up in air. Try competing against your parents or siblings to see who can keep their bubble from popping the longest.

Try blowing a bubble inside another bubble:

1. Mix the water, dish soap and sugar in the container/bowl until the sugar dissolves
2. Take some of the mixture and spread it onto the table
3. Take the straw and dip one end into the bubble mixture still in the container/bowl
4. Take out the straw and blow into the other end to make a bubble
 - a. When blowing the bubble, the straw should not be touching the table, but should be close enough that the bubble can touch the table
 - b. The bubble should end up on the table
5. Dip the straw back into your bubble mixture
6. Carefully put the straw through the first bubble
 - a. Remember that the bubbles can pop, so be gentle!
7. Then blow into the straw to make another bubble inside the first bubble
8. Repeat steps 5-7 again and again to see how many bubbles you can make

Share your creations!

Don't forget to share your experiments and creations with us! We would love to see what you've made. You can Email us at: esqinfo@uwaterloo.ca or send us a message/tag us on our social media!

Facebook: @uwengoutreach

Twitter: @UWEngOutreach

Instagram: @uwengoutreach

Thanks for exploring, discovering, and learning with us!

3, 2, 1 Done!

3 - Write or draw 3 things you learned from this activity

2 - Write or draw 2 things you found super interesting or cool and want to learn more about

1 - Do you have any questions about the activity? Did something make you wonder...what if? how? or why?