

# Science at Home



Are you looking for something to do to keep your brain active and engaged? We're here to help with Science at Home! You can do these fun science activities using commonly found items. You can also visit us at the Museum's [Science at Home](#) page for additional resources.

## Science of Foam Activities



### Materials Needed:

Flat surface that can get wet  
Cup of water  
Dish soap  
Straw  
Towel  
Large bowl

16 ounce bottle (*soda or water*)  
Old sock  
Scissors  
Instant coffee  
Hand blender

**Optional:**  
Corn starch  
Glycerin  
Small electric blender

### What We've Learned

Bubbles are made of air trapped in a thin layer of a liquid or solid. We often blow bubbles using soapy water, and this is possible because of molecules called surfactants, which are present in the soap. Surfactants have a hydrophilic (*water-loving*) head, which attaches to water molecules. The hydrophobic (*water-repelling*) tail of surfactants attaches to the air molecules inside and outside the bubble.

### Natural Connection



Foam is a collection of bubbles attached to one another. Although it is rare in nature, there are several examples of animals that can create bubbles and use foam for various purposes. One example is the Praying Mantis. Females create a Styrofoam-like ootheca (*egg case*) which protects the eggs inside. You may have spotted these brown cocoon-like egg cases attached to twigs outside!

## A

### Making Bubbles with Your Hands

#### Instructions:

1. Put 2 cups of water into the bowl.
2. Add 2 tablespoons of dish soap.
3. Stir well to mix in the dish soap.
4. Place your hands side by side forming a triangle (*or diamond*) with your index fingers and thumbs.
5. Place your hands just below the surface of the water and raise them carefully. Can you form a bubble in the triangle?

#### Questions to Ask:

Since bubbles pop so easily, what can you conclude about the presence of foam in nature? Is it a rare phenomenon and why?

What chemical property keeps the surface tension of water? What does the dish soap do to the surface tension of the water?

What happens if you add a tablespoon of corn starch to the soap and water? What about a tablespoon of glycerin?

What other soaps could you use? Do they make more stable bubbles than dish soap? Why?

**B**

## Making a “Bubble in a Bubble”

**Instructions:**

1. Wet a flat surface with some water (*a spray bottle will work*).
2. Put a drop of dish soap on the wet surface.
3. Use a straw to swirl the soap a little on the wet surface.
4. Place the straw into the soap and gently blow a bubble.
5. Place the straw in soapy water and blow a second bubble within the first bubble on the flat surface.

**Questions to Ask:**

Will a dry surface work for blowing bubbles?

What happens if you try and blow a bubble with a dry straw?

What happened if you touch the first bubble with the dry end of the straw?

**C**

## Make a Foam Snake using a Sock and a Water Bottle with Cap

**Instructions:**

1. Cut the bottom of a water bottle off and slide the sock over the bottom of the bottle.
2. Use the duct tape or a rubber band to secure the sock. (*May not be needed if you can slide the sock far enough and it will stay on even when you blow*.)
3. Make a hole in the cap of the water bottle.
4. Use the soapy water you made to make a bubble with your hands.
5. Dip the sock covered bubble blower into the solution and gently blow through the hole in the cap.

**Optional:** Add different food coloring drops onto the sock-covered end of the bottle to make a rainbow bubble snake!

**Questions to Ask:**

Why does the foam blower not just blow one bubble?

Why does the foam remain as a long snake?

**D**

## Foam and Instant Coffee

**Instructions:**

1. Gather 3 small glasses or cups
2. Pour one-half cup of water in the first glass.
3. Use the blender in plain water — make observations. This will be your reference liquid.
4. Pour one-half cup of water into the second glass
5. Place one tablespoon of instant coffee in the second glass
6. Blend with the hand blender.
7. Put equal portions water and coffee into the third glass and blend.
8. If foaming is an indication that surfactants are present, how can you test if milk and orange juice have surfactants?

**Questions to Ask:***Ask after Step 3:*

Can you see any bubbles or foam? How long do the bubbles last?

*Ask after Step 6:*

Are there more bubbles than with the plain water? Do the bubbles last longer?

What does this tell you about the coffee solution? Does it contain surfactants?

*Ask after Step 7:*

What happens now?

**Having Fun?**

We want to see! Tag **@naturalsciences** on social media, so we can see you and your loved ones enjoying our Science at Home activities.