

# Montshire at Home: Teacher Guide

**WEEKLY THEME: BUBBLES** – Invite your students to do open science play with bubbles as they experiment with the different properties of liquids and air, all with easy-to-access supplies students have readily available at home.

**MONTSHIRE AT HOME** is a series of learning activities, resources and short videos, developed, hosted and curated by the Montshire’s Education team. It’s designed to support children, families, and teachers with easily accessible concepts, content, and materials while learning at home.

Teachers can use these materials to support remote science learning opportunities for their students at home. Below is a suggested learning progression using this week’s theme, activities, and resources found on the Montshire’s Online Resource web page.

## SUGGESTED LEARNING PROGRESSION

### Day 1: Make Your Own Bubble Solution; Bubble Facts

#### EXPLORE

- ▶ What shapes are bubbles?
- ▶ Why are there rainbows in bubbles?
- ▶ What is a bubble made of?

#### DISCOVER

- ▶ Bubbles are spheres/balls because spheres have the smallest surface area per unit volume.
- ▶ Rainbows come from thick and thin sections of bubble film interacting to reflect different colors of the rainbow (different wavelengths of light).
- ▶ Bubbles are made of a lipid surrounding something—in our case, air.

#### EXTENSION

- ▶ How are bubbles like cells?

### Day 2: Soap Scavenger Hunt in Your Home

#### EXPLORE

- ▶ How many soaps can you find in your home?
- ▶ Compare a small amount of each soap on a plate. How are they different?
- ▶ Drop a small amount of soap in a cup of water. How do they behave?
- ▶ Make bubble solutions from different soaps at home. Which gives the best results?

#### DISCOVER

- ▶ Viscosity is the thickness of a liquid and measures how fast it can flow.
- ▶ Density varies in liquids and can be seen in how they sink or float in water or each other.

#### EXTENSION

- ▶ Compare the ingredients in different types of soaps. Which are always present? Which are familiar? What is the longest named ingredient?

### Day 3: Bubble Wand Scavenger Hunt

#### EXPLORE

- ▶ Search around your house for objects that might make good bubble wands
- ▶ Go outside and test!
- ▶ What shape are your bubbles?
  - Are they the shape of the hole(s) in the wand?
  - Are they all spheres?
- ▶ Which wands make the smallest bubbles? The biggest bubbles?
- ▶ Which wands make just one bubble at a time? Lots of bubbles at once?

#### DISCOVER

- ▶ Bubbles use the smallest amount of soap when they form—which is a sphere!

#### EXTENSION

- ▶ **Older Students:** Show the math that proves that spheres have the smallest Surface Area per volume compared to other shapes.
- ▶ **All ages:** Classify/sort wands into categories: big/little bubbles, single/multiple bubbles.

### Day 4: Foam Maker

#### EXPLORE

- ▶ What do you notice about the bubbles made by your foam maker?
- ▶ What is making the holes that bubbles are coming out of?
- ▶ Think about what you could change to make the foam frothier—more like shaving cream or whipped cream.
- ▶ Think about what you could change to make the foam have bigger bubbles.

#### DISCOVER

- ▶ Foam is lots and lots of bubbles! The density or consistency of the foam has to do with how many bubbles per unit volume. The more bubbles in a certain area (which also means the smaller the bubbles), the frothier the foam.

### Day 5: Giant Bubbles

#### EXPLORE

- ▶ Build a large and flexible bubble wand using yarn and straws.
- ▶ Experiment with how you open and close the wand as you move it through the air.
- ▶ What other materials can you find to make a wand with?

#### DISCOVER

- ▶ A bubble wand needs to form a connected shape.
- ▶ Opening a wand allows air inside of a bubble. Closing it seals off the bubble.
- ▶ Different wand materials have different properties, including: absorption, flexibility, and tendency to tangle.

#### EXTENSION

- ▶ Make giant bubbles outside to see how wind affects their formation and behavior!

## **Make your own bubble solution at home!**

- 7 1/2 cups warm water
- 1 pinch guar gum  
(can substitute with corn starch  
or corn syrup)
- 1/2 cup dish soap

### **Directions**

Mix guar gum with warm water and  
stir until the clumps dissolve.

Stir in the dish soap.



## Slippery Soap Scavenger Hunt

How many different soaps are hiding in your home?

- |                                       |   |                                |
|---------------------------------------|---|--------------------------------|
| <input type="checkbox"/> hand soap    | <input type="checkbox"/> shampoo        | <input type="checkbox"/> ..... |
| <input type="checkbox"/> bar soap     | <input type="checkbox"/> scrubbing soap | <input type="checkbox"/> ..... |
| <input type="checkbox"/> dish soap    | <input type="checkbox"/> .....          | <input type="checkbox"/> ..... |
| <input type="checkbox"/> laundry soap | <input type="checkbox"/> .....          | <input type="checkbox"/> ..... |

Choose three soaps you found to experiment with. You'll need only a small amount of each soap in its own little cup – and some little spoons.

How do soaps move? Take a small spoonful of each soap and slowly drip it onto a plate. Poke it. Describe it. Draw it.

Soap 1	Soap 2	Soap 3

Okay ... now tip the plate to watch the soap flow... and mix them all up!

How do soaps float? Slooowly drip a spoonful of soap into a clear cup of water. Does it float or sink? Dissolve or stay together?

Soap 1	Soap 2	Soap 3

Blow with it. Add water to each little soap cup and stir. Use a bubble wand to test out your new bubble solution. Which soap makes the best bubbles?

Soap 1	Soap 2	Soap 3

When you're done don't forget to wash your hands and the dishes – and maybe the cat too.



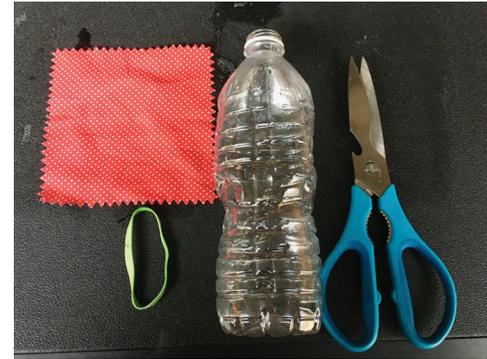
## Make Your Own Foam Fountain

Foam is lots and lots of tiny bubbles!

Follow these easy steps to make your own Foam Fountain at home!

### Supplies

- ▶ Plastic bottle
- ▶ Scissors
- ▶ Scrap fabric or a sock
- ▶ Rubber band
- ▶ Bubble liquid



**1** - Cut off the bottom of the bottle. (Please ask an adult!)



**2** - Cover the open bottom of the bottle with your fabric or sock, and secure it with a rubber band.



**3** - Dip the fabric-covered end of the bottle in bubble solution, then blow into the top. FOAM!