Age: 4+

Materials: Soap, Water, Plate, Pepper, Styrofoam, or packing peanuts, Toothpick

Introduction: This week, we will make a little boat that is powered by soap! Using the power of surface tension, we can pull a boat along the surface of the water.

Activity:

1) Fill a plate with clean tap water, and then sprinkle a little bit of pepper on the top. Watch how the pepper will create many evenly spaced floating islands. These flakes of pepper are resting on top of the water's surface. Water is very fascinating, and one of it's cool properties is called surface tension. Surface tension is like an invisible thin film that has been stretched across the water. It's because water likes to stick to itself, and that creates the layer on top.

Like soap, some substances are called surfactants, which means that they will break the surface tension. Think of it like poking a hole in a piece of stretched rubber. A small hole will get pulled bigger and wider from all the surface tension around it.

2) Dip your toothpick into the soap, and poke the middle of the pepper. All the pepper will rush away! Next, try poking other areas with pepper. More holes will appear.
3) Now, it’s important to realize that it’s not the pepper being pushed away by the soap, but rather that the water is pulling the pepper away as the surface tension contracts!

Now, what we can do is make ourselves a little boat! First, you will need to rinse off your dish and get new water. Every time you add soap to the water, it weakens the strength of the surface tension. This means we will need a fresh batch! I used a little styrofoam packing peanut because it is very light, and floats. Now, by putting a drop of soap on it, the soap will eventually drip down the side and gently touch the water.

Just like the pepper, once the soap touches the water, the boat is pulled along the water’s surface! Click the video link to see this in action. https://www.youtube.com/watch?v=pUnExD_J4O8