WATERSHED SURFACE TENSION EXPERIMENT

What you need:

- 1 dropper per student*
- 1 penny per student
- 1 cup half filled with clean tap water
- dish soap, any kind
- rags or sponges to dry up small puddles

Procedure:

1. Get a small cup of water from the tap. Make sure it is clean, without anything in it.
2. Place a penny in front of you on a flat surface like the floor or a table. Get a dropper full of water. Slowly squeeze a drop of water at a time onto the penny. **Count together how many drops fit**. Keep going until the penny over flows!
3. Students will see the water "bubble up" on the penny. Count how many drops can fit before they burst off and spill off of the penny. It will be more than you think!
    a. WHY?
    b. Water molecules attract each other and tend to stick together.
    c. This cohesion property results in surface tension. Water has surface tension.
    d. Because water molecules at the surface of the water puddle attract more to one other than they do to the air molecules above them, they cling together and form a dome shape on the coin.
4. Repeat the dropping, and make sure it is the same number or similar number of drops. Keep track of how many drops you can fit. It's good to have 4 sets of results. (older grades find an "average" of how many drops fit on the penny without soap)
5. NEXT STEP: ADD A SQUIRT DISH SOAP TO THE WATER IN THE CUP. MIX IT IN. Students repeat step 2 and 3 and see how many drops fit on the penny when the water is soapy. With the soap can you fit as many drops on the penny? Get at least 4 results with soap. (older grades find an "average" of how many drops fit with soap)

WHY?
The polar end of the soap can bond with the polar water molecules, reducing the water's surface tension. This is an advantage when washing clothes because this can allow the dirt and grease to be removed by water with detergent. However, it is not good in nature, as creatures in our ecosystem such as water striders have adapted to float on water. When soap enters the water, the water striders sink, and cannot survive, and it disrupts an ecosystem. Also, as the soap breaks down, it releases nutrients that can alter conditions within water ecosystems.

*You can use any dropper you find around the house or check this link to purchase:

https://www.google.com/search?q=plastic+eye+droppers&client=safari&rls=en&source=univ&tbm=shop&tbo=u&sa=X&ved=0ahUKEwj91qW23_7cAhWIwlQKHW_cBlgQ1TUI5gE&biw=1109&bih=726