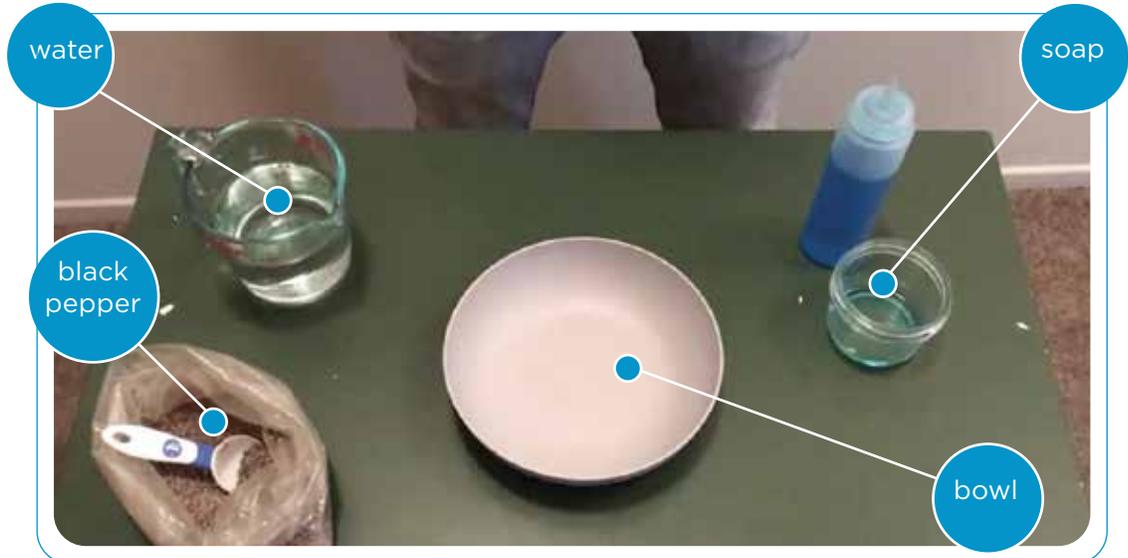


Pepper & Soap

WHAT DO I NEED?



What do I do?

1. Fill bowl with one inch of water.
2. Sprinkle water with black pepper.
3. Place fingertip in a bit of soapy water.
4. Touch fingertip gently to center of water.
5. Were you surprised? What were your observations?

What's going on?

This demonstration visualizes the effect dish soap has on the surface tension of water, and it helps to explain why soap is good for cleaning dirty dishes and germ-y hands.

Pepper sits on the surface of the water. This is because water has a high surface tension, meaning the water molecules have a strong attraction to each other and they like to stick together. As the pepper is so light, it sits on the surface of the water rather than sinking to the bottom. The pepper is also hydrophobic which means water is not attracted to it, and as such the pepper does not dissolve into the water, it just remains resting on the surface. When soap is added, the surface tension is reduced, and the water wants to spread out flat (water normally bulges up slightly, like when you overfill a glass of water.) As it spreads out it flattens on the dish and carries any pepper that's floating on the surface with it, away from the source of the soap and to the edge of the water.

What do you think?

- Does any pepper sink in the now soapy water?
- Try this again with fresh water and new pepper: What happens if you dip a wet (but no soap) finger into center of pepper?
- As science is always about trial and error, what may have went wrong? How did you correct?
- Can you think of some other experiments to try?