



Project Exploration creates transformative learning opportunities for youth underrepresented in the sciences --particularly students of color and girls -- by equipping them with the skills, practices, and mindset needed for a lifelong pursuit of learning. STEM@Home makes activities around science, technology, engineering, and math accessible and fun to do at home. This STEMbook activity, resources, and more are available at www.projectexploration.org/stemathome.

In this activity, you will:

Discover the properties of bar soap and compare how various brands differ in this simple and surprising science experiment. Does a bar of soap sink or float? What happens when you cook soap in the microwave? Does all soap behave the same way?



Supplies Required:

- Bowl of water
- Bar of Ivory soap
- Several bars of soap of other brands
(like Irish Spring, Lever 2000, Olay, Dial, or others)
- Microwave-safe plate

Video

How does soap work? <https://youtu.be/XR7agvwDOD4>

Overview

Ivory soap is made by whipping a whole bunch of air into the mixture. Little air pockets get trapped in the soap, making it light and fluffy. The air pockets make the soap less dense than water, so the soap floats. When Ivory soap is cooked in the microwave, it expands like a soap soufflé. This happens because water molecules stuck in the air pockets heat up and turn into water vapor. The water vapor escapes from the soap mixture, making it puff up and expand as it goes. Other brands of soap have varying degrees of air whipped into them. How are they similar to/different from Ivory brand soap?



Instructions

1. Place the bar of Ivory soap into the bowl of water to see if it sinks or floats. Record your observations.
2. Test out the other bars of soap one by one to discover if they sink or float.
3. To make the other walls, cut the third sponge in half
4. Place the bar of Ivory soap on a microwave-safe dish. Cook it in the microwave for 1 minute, watching it through the door of the microwave. What happens?.
5. Place the other bars of soap one by one in the microwave for 1 minute. (Remember: If you smell any burning soap, turn off the microwave immediately.) Record your observations of each brand.
6. Observations Is there a relationship between the density of a bar of soap and how it behaves when it is cooked in the microwave?
7. Now Try This! Weigh the bar of soap before and after it is cooked in the microwave. Does the weight change? Why?

Caution: The soap will be hot when it comes out of the microwave, so be careful not to touch it right away. If at any point you smell something burning in the microwave, turn it off immediately.

Additional Resources

1. Learn more about molecules: <https://youtu.be/npv74D2M06Q>
2. Making soap: <https://youtu.be/1baLzbathvI>

Share It Out

Share on social media: Record a video or take a picture of your activity and post the results online using the hashtags:

#FluffySoap
#ProjectExploration
#StemAtHome

Tag a friend and challenge them to do it, too!

For more activities like this one, go to www.projectexploration.org/stemhome. If you're interested in learning more about Project Exploration and our free events, programs, and activities, please find us on social media and be sure to follow!



Call or text us for help: 312-772-6634



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