



MAGIC SOAP?!



With this experiment, using water, pepper, and soap, you'll be able to control the way pepper moves without even touching it! Is it magic? Science? (We think it's a little bit of both!)

MATERIALS:

- Shallow bowl, pie tin, or plate (something that can hold water)
- Water
- Pepper (either regular black pepper or pepper flakes)
- Dish soap or a bar of soap
- Paper
- Pencil
- Toothpick (optional)

MAGIC SOAP EXPERIMENT

INSTRUCTIONS:

- Fill your bowl or plate with water.
- Sprinkle the pepper all over the water. You should see that the pepper sits on the top of the surface of the water.
- Stick your finger into the center of the bowl. What happens to the pepper? Write down what you see.
- Dip either the toothpick or a finger in the dish soap. You don't need a lot of soap, just enough to cover the surface.
- What will happen when you dip the soap into the water? Will anything change? Write down your best guess, or *hypothesis*, for what will happen.
- Dip the now-soapy toothpick or finger into the center of the bowl. What happens?

HOW DOES IT WORK?

When the soap is added to the water, the pepper should repel away to the edges of the bowl or plate. But why? Pepper is *hydrophobic*, which means that it doesn't like to mix with water. The molecules in water like to join together and create *surface tension*, so the pepper ends up floating on the top. Dish soap is great at breaking the surface tension of the water, which is how it cleans so well! When the soap touches the water, the water still wants to stay together, so it moves away from where the soap is. The pepper stays along for the ride, and pulls away from the soap as well!



OTHER QUESTIONS TO EXPLORE

- Does the amount of pepper change the way it looks? The amount of soap?
- Is dish soap the only way to repel the pepper? What about olive oil? Or hair spray?

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- For more experiments and explanations of surface tension, visit [Explora for Grades K-8](#) and search "surface tension experiment".
- For fun books about science, visit [TumbleBooks](#) and search "science".
- For more secrets of science revealed, visit [TumbleBooks](#) and use the title search to find "How Things Work".

**This experiment was inspired by a project highlighted on Scientific American's website:
www.scientificamerican.com**