



EPIDEMIOLOGY Pepper Germs



MOREHEAD
PLANETARIUM+
SCIENCE CENTER
The University of
North Carolina at Chapel Hill

BIG IDEA

It takes soap, scrubbing, and water to keep your hands germ-free!

MATERIALS

- Ground pepper
- Bowl of water
- Liquid Soap
- Paper

INSTRUCTIONS

1. Fill a bowl with some water and sprinkle some pepper flakes around in the water. What do you notice? The flakes probably float on top. Why could that be?
2. Dip your hands in the water, swirl them around and take them out. You've probably got pepper on your hands!
3. What do you think would happen if you touched something? Let's try it out! Press your hand to a piece of paper. Some of the pepper probably comes off your hand and sticks to the paper.
4. Now let's see what happens when you add soap to the mixture. Put a large drop of soap onto your finger and dip it into the center of the bowl. What happens?
5. Well now we still have pepper on our hands; let's get it off! Put some soap onto your hands and scrub them. Scrub for 20 seconds, then rinse! Is there any more pepper on your hands?

THE SCIENCE

In this experiment, think of the pepper flakes as germs. When you touch surfaces that have germs on them, those germs stick to your hands. Then, when you touch other objects (like the paper), you transfer germs to it! That's why it's very important to wash your hands frequently.

Why does the pepper float on the surface? Much like germs, the pepper flakes are light and **hydrophobic**. If something is hydrophobic, then it repels water because it's literally "afraid" of it. Because of this, the pepper will either float on top of the water or (if you touch or mix it) sink to the bottom.

Why does the pepper spread out so quickly? Water is very good at "sticking" to itself because it has a high **surface tension**. When you add soap to water, the soap breaks up that surface tension and the water spreads out. It catches to pepper flakes in this small wave and pushes them to the edge!

Since germs are hydrophobic, it is important to use soap and scrubbing action to remove them from surfaces such as your hands!