mystery science

Grades K-5
Mini-Lesson: “How does hand sanitizer kill germs?”

VIDEO TRANSCRIPT

That was a real sneeze. I have a cold right now, but did you notice I sneezed into my elbow? That way I didn't spread germs, like if I had sneezed into my hand instead. Whew!

Someone named Ellie has a question about germs. Let's give her a call now.

[Video Call]
- Hi, Ellie!
- Hi, Doug!
- I have a question for you. How does hand sanitizer kill germs?
- That's a great question.

Whenever you are sick and you sneeze, you've probably got lots of adults telling you to use hand sanitizer. You're always told it kills germs. It even says so on the bottle. But how does it work? How does hand sanitizer kill germs? After all, when you rub hand sanitizer on your hands, it's not like you can see it working—germs are too small to be seen.

In fact, for a long time, doctors and scientists didn't even know that germs existed. They tried all sorts of things to stop sicknesses from spreading, but without knowing about germs, that was really hard to do.

The first big step forward was the invention of this—the *microscope*. The very first microscope was invented in the 1600s by someone named Antonie van Leeuwenhoek. Now, you might notice how it didn't look much like the microscopes we have today. But having a microscope meant it was the first time that we could see things as small as germs.

Van Leeuwenhoek took his first microscope and placed a drop of pond water on the lens. He was amazed by what he saw. It looked like this—you see all those little things swimming around? He called them “little animals”. He still didn't know that some of these little things could cause people to get sick.

Eventually, though, other scientists figured out that these “little animals” aren't animals at all—they're *germs*. As microscopes have gotten better, we have discovered that there are all different kinds of germs.

Some germs are really weird-looking. Like this one, called an amoeba. It's like this microscopic blob that moves around, but one of the most common germs looks like this. They're called bacteria. Personally, I always thought they kind of looked like little hot dogs. Not all bacteria make you sick. Some of them aren't bad at all, but if you've ever had strep throat, that's a sickness caused by a type of bacteria. This is what strep bacteria looks like under a microscope.

Here's another common germ. It's known as a virus. Just like bacteria, there are lots of different kinds of viruses. The virus on the left is the one that causes the flu, but not all viruses look like that. The ones on the right here, to me, almost look like little alien robots.

It's so easy for us to carry around these microscopic bacteria and viruses all over our hands without even knowing it. Scientists realize that if we could discover ways to kill or remove some

of these germs, then we could stop sickness from spreading. Hand sanitizer is one of the ways that we can kill germs, but how does it work?

Well, how do you think hand sanitizer kills germs? Now would be a good time to pause the video and discuss. Here's a clue, think about how your hands feel after you've used it. Especially if you use it a lot.

Okay. You ready?

Well, you might have noticed that when you use hand sanitizer, especially if you use it a lot, it can leave your hands feeling really dry. That's because hand sanitizer is mostly made of a substance called alcohol. Alcohol is a substance with many interesting properties. One of these properties is that alcohol is really good at drying things out.

Alcohol dries up the oils on your skin which is what makes your hand feel dry. But, while it's doing that, it's also drying up the germs on your skin. When germs get dried out, their outer layer gets broken open, instantly killing the germ.

Now, keep in mind, if your hands actually have dirt on them, using hand sanitizer isn't going to get the dirt off. For that, you still need to wash your hands with soap and water. Plus, washing your hands with soap and water also washes germs away.

So, if you have sensitive skin or you just don't want your hands to feel dried out, you can wash your hands instead of using hand sanitizer.

So, in summary, hand sanitizer kills germs because it's mostly made of alcohol and alcohol can break open the outer layer of germs like bacteria or viruses. Doctors recommend using hand

sanitizer whenever you don't have soap and water to wash your hands so that you can keep from spreading germs.

That's all for this week's question. Thanks, Ellie, for asking it!