

SCIENCE WORLD

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In this activity you will investigate how soap and water works! Paint will act as the pathogen on your hands that you are trying to remove, first with water alone and then with both soap and water.

VOCABULARY LIST

Pathogen: Any organism that causes some sort of disease in the body. One example is SARS-CoV-2, the virus that causes the disease called COVID-19.

Hydrophilic: Attracted to water (likes water)

Hydrophobic: Repels water (water-fearing) but is attracted to fats and oils

Virus: An infectious agent that can only replicate (make a copy) within a host organism

Molecule: Two or more atoms held together by chemical bonds

BACKGROUND SCIENCE:

Many pathogens spread by droplets that come from an infected person when they cough, talk, or sneeze. A healthy person may touch a contaminated surface, then touch their own mouth, eyes or nose, causing the illness to spread. Luckily, there are ways to help stop the spread of illnesses. One of the best ways is to wash our hands with soap and water! We should wash our hands after coughing or sneezing and before touching our face (especially when we've been out-and-about).

Soap molecules are long and thin. Each one has a hydrophilic (likes water) head and a hydrophobic (doesn't like water) tail. Many pathogens (like viruses) have a fatty layer on the outside. When you use soap and water, the hydrophobic tails of the soap molecules surround the virus. They push inside the fatty layer and destroy the pathogen.

The hydrophilic heads of the soap molecules attract water molecules, which can then wash away the broken pathogen.

FUN FACT:

Hand sanitizer is great to use when you're not near soap and water, but it doesn't kill all germs. Soap and water do a better job of cleaning our hands!

MATERIALS:

- Finger paints
- Something to cover the eyes (like a blindfold)
- Running water (sink) and soap

WHAT TO DO:

Step 1

- Put a dime-sized blob of paint on the palm of your hand.



- Rub it all over your hands and let it dry.
- Go to the sink.
- Have a friend tie a blindfold (or similar) over your eyes and get them to turn on the tap for you (safety: water should be warm, not too hot).
- Place your hands under the running tap for 5 seconds (your friend can count for you) – don't rub them, just hold them there!
- Have your friend turn off the tap and remove the blindfold.
- Take a look at your hands – What do you notice?
- Repeat the process for 10 and 20 seconds (friend to count time) – What do you notice each time?

Step 2

- Reapply another blob of paint and let it dry.
- Go to the sink and take hold of the soap.
- Have a friend tie a blindfold (or similar) over your eyes, and get them to turn on the tap for you (safety: water should be warm, not too hot).
- Use the soap and water to wash your hands for 5 seconds (your friend can count for you). This time you can rub your hands together with the soap and water.
- Have your friend turn off the tap and remove the blindfold.
- Take a look at your hands – What do you notice?
- Repeat the process for 10 and 20 seconds (friend to count time) – What do you notice each time?

WONDERINGS:

1. What did you notice each time you took off your blindfold?
2. Did you notice that there were any specific parts of your hand that you tend to scrub less?
3. Based on your observations, what do you think is the ideal time and method for washing your hands?