

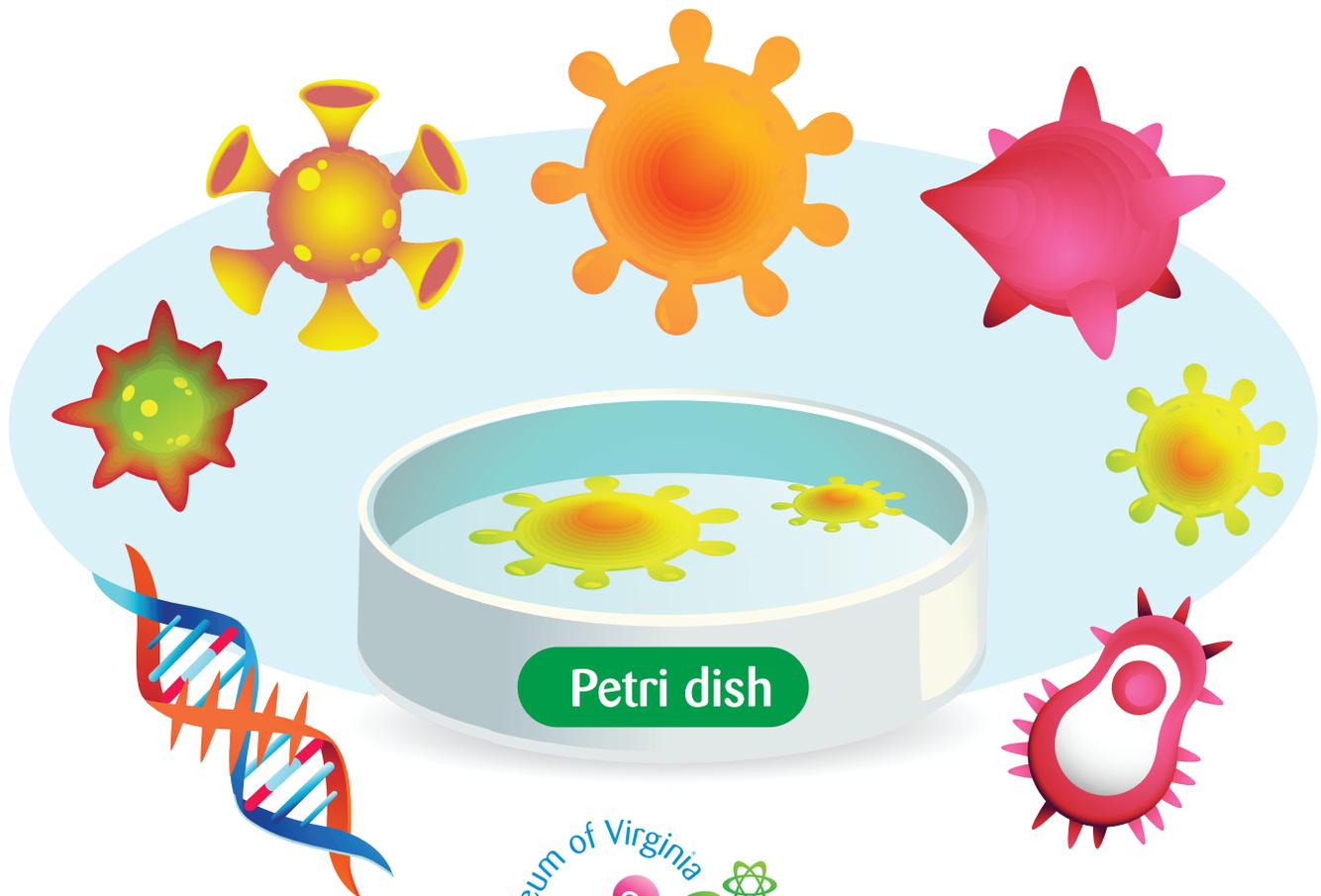
Moldy Bread Petri Dish

We keep hearing that hand washing is important, right? Beyond removing visible dirt and oils, washing hands is important to help eliminate the microbes such as bacteria, fungi and viruses that might make you sick. Microbes are everywhere and they are not all bad. In fact, humans are home to many, many, MANY microbes that make their homes on and in your body and many of them are essential for our survival! It's pretty cool to think you are never alone. You always have your microbe friends!

Although being told to wash your hands isn't new, how well do you really wash your hands? Does it matter what you use to wash them? What's best: hand sanitizer or soap and water?

This activity will help you design a controlled experiment to test a variety of different hand washing variables. The bread serves as a food source for microbes.

In a scientific research lab, a **Petri dish** is a shallow, clear, lidded container that is used to grow microbes on a food substance. In this experiment, instead of using Petri dishes, we are using bread (for the food) and the zip top bag for the lidded dish.

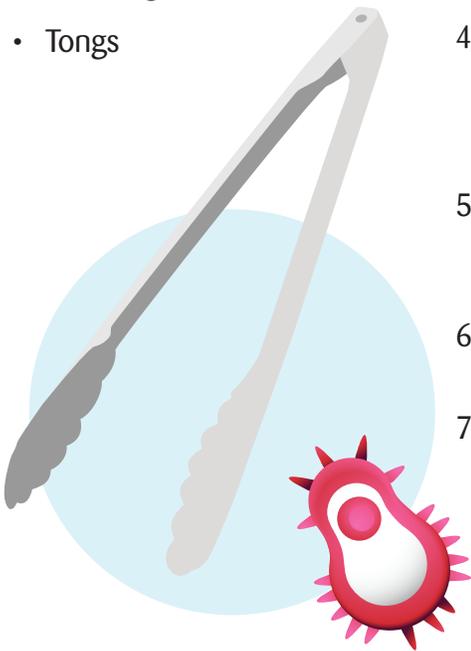




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What You'll Need

- At least three slices of white bread (homemade or from a bakery work best; the fewer the preservatives the better)
- Zip top bags, one for each slice of bread
- Permanent markers to label each bag
- Tongs



What You'll Do

1. First, you will need to setup a **control**. In an experiment as you test different **variables** (things that change or test) you want something you compare the changes to. This is called your control. In this case, it will be a slice of untouched bread.
2. Being careful not to touch any of your bread slices, using the tongs to select one slice to slide into one of the zip top bags. Seal it tightly (squeeze the air out) and then label it with your marker "Control."
3. Next, take a second slice of bread and gently rub it against unwashed, dirty hands. Put it in a second bag, seal it and label it "Dirty hands."
4. Now, go wash you hands with soap and water for at least 20 seconds! With your clean, dry hands, take a third slice of bread and gently rub it against your clean hands. Put it in a third bag, seal it and label it "Washed hands."
5. Keep the bags sealed in a cool, dry location and using the chart below, record any changes you notice once a day for at least one week. Do NOT open the bags!
6. You can also keep a photo diary of your bread slices. Take a photo of each slice at the same time every day to accompany the data in your chart.
7. Make some predictions about what might happen. Will all of the bread slices grow microbes? Only some of them? Which ones? Will they grow microbes at different times?





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What to Notice

- Usually, the dirty hand slice develops microbe colonies first. Because microbes are everywhere in our environment, all of the slices may develop colonies given enough time. If your hand washed slice grows colonies first, you need to do a better job washing your hands!
- Try repeating the experiment with different variables (without forgetting the control). You could use just hand sanitizer before touching a slice. You can also try different surfaces in your home. We tried gently rubbing a slice on a computer keyboard. Check out our results!

What to Remember

- Washing your hands with soap and water *can physically* remove dirt and microbes from your hands, even if it doesn't kill the microbes.
- Second, soap itself can kill some viruses and bacteria--including the coronavirus--by literally pulling the virus apart.
- Although hand sanitizers with at least 60 percent alcohol can break apart some viruses, hand sanitizers cannot physically remove dirt and microbes. So watching your hands is always best!

