

Life Science Activity Bag

Destroying Viruses: Student Activity Guide

Wash your hands!!! We hear this every day, especially during the COVID pandemic. What does hand washing do? How does it help prevent me from getting sick? This activity will explore these questions and provide a better understanding of viruses.

These directions will get you started. Your teacher will be in contact to guide you and provide information.

Materials From The Bag

- Aluminum Foil
- Double-Sided Tape
- Radish Seeds (If you have not done the ecosystem activity, save a spoonful of seeds)
- Paper Plate
- 2, Plastic Squat Cups
- Spoon (Will also be used in the ecosystem activity.)

You Will Supply These Materials

- Water
- Soap
- ½ Stick of Butter or Butter Substitute (soften)
- Scissors

Preparation:

1. The butter, or butter substitute, needs to be at room temperature to soften.
2. Cut or tear the **aluminum foil** into **six** equal pieces. We will use **two** pieces for each part.
3. Cut the **tape** into **six** equal pieces. We will use **two** pieces for each part.
4. Pour the seeds onto the plate. If you have not done the ecosystem activity, save a spoonful of seeds

Part 1: Different Structures of Viruses

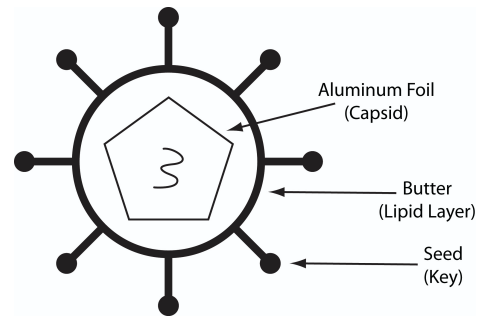
For this activity we will explore the effect washing our hands has on viruses. First, we must build two viruses.

1. Take two pieces of aluminum foil and roll each piece into a ball.
2. Wrap a piece of tape around the foil ball, and roll the ball in seeds. The seeds should cover most of the ball. This will be called “virus-A.” Set “virus-A” to the side. The tape may not cover the entire foil ball.
3. Take another piece of tape, wrap it around the foil ball, **place a thick layer of butter around the entire ball**, and roll the ball in seeds. This will be called “virus-B.” Set “virus-B” to the side.
4. Squirt some soap into the two cups and fill them $\frac{2}{3}$ of the way with water, creating soapy water. *What do you think will happen to the viruses when you place them into the soapy water?*
5. Place “virus-A” into a cup and stir, to simulate hand washing. Per CDC guidelines, when washing your hands you want to wash for about 20 seconds. While you stir, sing “The Happy Birthday Song” two times, which is about 20 seconds. Take “virus-A” out of the cup. Place both the cup and “virus-A” to the side.
6. Repeat **step 5** using “virus-B.” *Compare “virus-A” and cup to “virus-B” and cup.*
7. Clean and rinse cups to be used in Part 2 and 3.

What's happening...

Viruses make other organisms sick when they have a perfect “key” to fit “locks” on the surfaces of the cells of those organisms. The seeds represent “keys” on a virus that allow it to enter and infect a cell. If the “keys” are removed, the virus is destroyed. *Based on this information, which virus, A or B, was destroyed? Provide evidence to support your claim.*

Not all viruses are created equal. What was the main difference between the two viruses? “Virus-B” had a butter, or lipid (fat), layer. Viruses that have this layer of fat are called **enveloped viruses**. Influenza, Ebola, and coronavirus (COVID-19) are enveloped viruses. Viruses without a lipid layer are **non-enveloped**. Common Colds, Dysentery, and Polio are non-enveloped viruses.



“Virus-B” (Enveloped Virus)

We have just learned that handwashing is effective for destroying enveloped viruses. However, sometimes we do not wash our hands long enough or we skip using soap. The next two parts explore what happens to an enveloped virus during longer and shorter handwashing times, and skipping and using soap.

Part 2: Handwashing Time

Does the amount of time you spend washing your hands really matter? In this activity, we will explore this question.

1. *How do you think the amount of time you spend washing your hands will affect “virus-B”?*
2. Since we are only using enveloped viruses, make **two “virus-B”** viruses following the instructions in **Part 1 #3**.
3. Fill two clean cups $\frac{2}{3}$ of the way with soapy water.
4. Place one “virus-B” into a cup and stir for **ONLY** two seconds. Remove the virus. Place both the cup and the virus to the side.
5. Place the other “virus-B” into a cup and stir. While you stir, sing “The Happy Birthday Song” two times. Remove the virus. *Compare both viruses and their cups.*

After looking at your viruses, does the amount of time you spend washing your hands matter? Provide evidence to support your claim.

Part 3: Soap

Does using soap when washing your hands really matter? In this activity, you will explore this question.

1. *How do you think using soap will affect “virus-B”?*
2. Make **two “virus-B”** viruses following the instructions in **Part 1 #3**.
3. Fill one clean cup $\frac{2}{3}$ of the way with **ONLY** water.
4. Place one “virus-B” into a cup and stir. While you stir, sing “The Happy Birthday Song” two times. Remove the virus. Place both the cup and the virus to the side.
5. Fill one clean cup $\frac{2}{3}$ of the way with soapy water.
6. Place the “virus-B” into the cup and stir. While you stir, sing “The Happy Birthday Song” two times. Remove the virus. *Compare both viruses and their cups.*

After looking at your viruses, does using soap when washing your hands matter? Provide evidence to support your claim.

Washing your hands with soap destroys the lipid layer and removes the keys, killing the virus.