Science Project Essay

This science project will be focusing on one question. “Does scrubbing and washing your hands for longer periods of time increase the amount of bacteria removed?” The reason why this project is focusing on this experiment is so that we can see if proper washing is actually affected by time and if it is, will it be a positive or negative effect? It also will try to show the importance of washing your hands for the recommended period of time and it will try to find if longer time periods are way more effective. I predict that if we wash our hands for more than 20 seconds, then the amount of harmful bacteria will decrease because soap stays in the hands for a longer time, allowing it to have more time to kill even more bacteria. The goal is to see if the removal of bacteria is only based on the intensity and effectiveness of the soap or if time also plays a crucial role in killing bacteria. The sources listed will be the CDC, The International Journal of Environmental Research and Public Health, and The Cleveland Clinic, Citron Hygiene, and Claudia Hammond. “Nonetheless, evidence suggests that washing hands for about 15-30 seconds removes more germs from hands than washing for shorter periods. Accordingly, many countries and global organizations have adopted recommendations to wash hands for about 20 seconds (some recommend an additional 20-30 seconds for drying),” “The results from the hand hygiene experiment indicate that washing hands with warm water and soap for 20s is the most effective method investigated when hands are either dirty or greasy.” “You probably heard this all the time as a kid or constantly repeat it to your kids: “wash your hands!” But what does it mean to wash your hands, and why does the method matter? Scrubbing for at least 20 seconds, using proper technique, gets rid of germs that can make you sick.”

In order to gather information about my hypothesis, I had 4 volunteers and I used swabs in order to obtain bacteria from their hands. I would do this before having them go to the restroom. Before all of this, I would have my volunteers do their everyday activities in order to see how much bacteria we accumulate during the day. Once they have washed their hands, I would grab new swabs and rub them in their hands again. I will have one volunteer wash their hands for twenty seconds, another for 25, and another for 30. My 4th volunteer is in my control and he will properly wash his hands for 20 seconds too. Once I have gotten all the samples, I will prepare my petri dishes and I will rub every swab inside their own petri dishes. After that, I will let the bacteria grow and will wait to see the results.

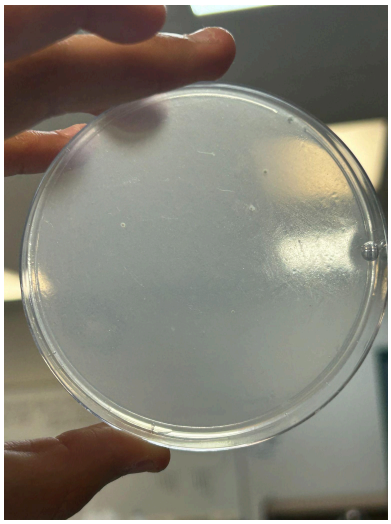
MATERIALS:

- **6 cotton swabs**
- **6 prepared petri dishes**
- **Regular Antibacterial Hand Soap**
- **3 volunteers**
- **Water**
- **A timer**

Procedure:

1. **Gather your volunteers and have them do their daily activities**
2. **Starting from 12 PM, after 7 hours, gather them all and swab their hands thoroughly**
3. **The first three swabs will be before the volunteers wash their hands, the other three swabs will be used AFTER they wash their hands.**
4. **Once all swabs are collected, you will rub the first three swabs in their designated petri dishes.**
5. **You will then grab the other three swabs and rub them into their designated petri dishes as well.**
6. **Once you're done, place them inside a bag to contain warmth, and humidity**
7. **After 1-2 days, bacteria will start growing, you will then start analyzing the results.**

Analysis and Results:



After analyzing the petri dishes and gaining information. The results showed that some of the trials varied. The petri dishes were measured by how many spots were seen in the petri dish. Surprisingly, the twenty-five second trial increased in bacteria rather than decreased. But the other two trials successfully lowered the amount of bacteria, with the twenty second trial starting with ten spots, and ending with only three. The thirty second trial started with six, and ended with three spots. I believe that the result for the situation in the twenty-five second trial was due to the bacteria the volunteer had on their hands or the incubation methods.

In conclusion, I believe that my hypothesis was slightly correct. The result for the twenty-five second trial was the complete opposite from what was expected. However, the study DOES show that twenty seconds is sufficient in order to remove a great amount of bacteria, after twenty seconds, the bacteria might lower slightly, it will no longer kill in large quantities. Five or ten more seconds after twenty seconds of washing is not necessary since the soap has already done its effect and can no longer kill as much as managed to in the first twenty seconds.