

Lab 2

Effectiveness of Handwashing & Mask Wearing

Effectiveness of Handwashing for 20 seconds:

Theory:

Your body harbors normal flora bacteria and other microorganisms on the surface of your skin and washing your hands is one way in which to reduce their numbers. *You can not technically sterilize living human skin, but removing many of the microbes can dramatically reduce your chance of spreading or catching a disease which is contact spread.* One specific method of contact transmission which typically involves the hands is the **fecal-oral route**. This is typically seen when people use the bathroom or change a baby's diaper and do not wash their hands with soap and water afterwards.

This lab should provide an eyeopening experience to your typical method for washing your hands. The more honest you are with this lab, the more you will learn about your own hygiene habits. **The Center for Disease control has a very good website (www.cdc/handwashing/) that discusses proper handwashing methods, when to wash them, and has all the scientific studies to back it up.**

Lab Procedure:

1. Obtain one petri dish of Nutrient Agar and write your name, the date, and divide the *bottom* into 4 sectors and label them Positive Control, Negative Control, 20 Seconds Water Only, 20 seconds Soap & Water.
2. For the "**Negative Control**" sector, do nothing and do your best to NOT touch it with anything, including prolonged exposure to air.
3. For the "**Positive Control**", rub a small amount of dirt on your hands and swab them. Inoculate the corresponding sector of your Petri dish. You expect this sector to have maximal colony numbers and variety because you are putting microbes directly onto the sterile food.
4. Rub a small amount of dirt between your hands, preferably over one of the black or red trash cans to avoid making a big mess, then wash your dirty hands for **20 seconds** with only **warm water**. Blot dry with a paper towel. Using a new sterile swab, sample your palms, nails, cuticles, and in-between your fingers then inoculate the "**Washing with Water Only**" sector on the Petri dish.
5. Rub a small amount of dirt between your hands, preferably over one of the black or red trash cans to avoid making a big mess, then wash your dirty hands for **20 seconds** with **Soap & Water**. Blot dry with a paper towel. Using a new sterile swab, sample your palms, nails, cuticles, and in-between your fingers then inoculate the "**Washing with Soap & Water**" sector on the Petri dish.
6. Put the completed Petri dish *lid-side down* in the area directed by the instructor for Room Temperature incubation and observe your findings next week.

Mask Effectiveness during a Cough:

Theory:

Your mask is hopefully a good enough filter to work in both directions—to protect you and to protect others. Your mask should block not only microorganisms trapped in the fluid droplets from your own cough, sneeze, or loud talking from escaping far enough to harm others, but also act as a barrier to block the same things from getting in your mouth or nose. Respiratory Droplet spread is common way respiratory diseases are spread and mask wearing is a helpful (not perfect) preventative measure. This lab will attempt to demonstrate the effectiveness of mask wearing using your own normal flora found in your mouth today.

Lab Procedure:

1. Obtain one petri dish of Nutrient Agar and write your name and date on it. Write “no mask” on it. Open it up, and without wearing a mask, hold the dish **a foot away** from your mouth and cough forcefully on it **5 times**. Put the lid back on it. Do this behind your partition or in a location of the lab far from others. Safety first!
2. Obtain a second petri dish of Nutrient Agar and write your name and date on it. Write “mask worn” on it. Open it up, and while wearing your mask, face the dish at the same distance as the other one and cough forcefully on it **5 times**. Put the lid back on it. Do this behind your partition or in a location of the lab far from others. Best to be safe, even with the mask on.
3. Put the completed Petri dishes *lid-side down* in the area directed by the instructor for Room Temperature incubation and observe your findings next week.

NOTE: There is no handout to turn in during Lab 2 as we need to have results from both experiments to answer the 4 questions. Still, look at the questions to see what they are and it will be much easier to work on your answers at the next lab.

Notes:

Lab 2 Questions (Due at the beginning of lab 3)

Name: _____ **Grade:** _____ **of 10 points**

Handwashing Experiment Questions:

1. (3 points) Rank the Quadrants of the Handwashing lab from the MOST growth to the LEAST growth.

<u>Growth Rank:</u>	Name of Quadrant of <u>20 Second Petri Dish:</u>	Number of colonies seen:
1. (most growth):		
2. (2 nd most growth):		
3. (3 rd most growth):		
4. (least growth):		

2. (2 points) You kinda expect the results in question 1 to be obvious, but occasionally the results don't match your expectations. Describe any unexpected results you (or other students) experienced with the handwashing experiment. Hypothesize what might have contributed to the unexpected results.

3. (3 points) Describe the results of the cough experiment with and without the masks on by filling in the chart:

	Growth Present (Yes or No)	total # of individual colonies seen on Petri dish	# of different kinds of colonies seen on Petri dish
Cough with No Mask			
Mask Worn during the cough			

4. (2 points) You kinda expect the results in question 3 to be obvious, but occasionally the results don't match your expectations. Describe any unexpected results you (or other students) experienced with the coughing/mask experiment. Hypothesize what might have contributed to the unexpected results.