

Name: _____ Class: _____

Lab - Discovering the Conditions That Promote the Growth of Bacteria

- I. Problem: Which place in the school is the most unsanitary (will have the most bacteria)?
The purpose of this activity is to investigate various microhabitats to determine which characteristics of these microhabitats most effectively promote the growth of bacteria.



II. Background Information:

Even though we can't see them, microbes are present wherever the proper conditions exist to sustain life. They live in and on humans and other animals, as well as on plants. They also live in the water, soil, and air. In this investigation, you will scavenge for bacteria in various microhabitats.

Van Leeuwenhoek sought out bacteria and other microbes in many environments. He collected standing water from ponds and roadside ditches. He made infusions of peppercorns, hay, and beans. He also scraped the plaque from between his teeth. Each time he looked at something new he described his observations in his diary. To convince other people that he wasn't imagining his "wee beasties," he hired an artist to look through his microscopes and draw what he saw there.

We know that the more an area is consumed (stepped on, etc.), the more bacteria there will be growing. We all know that underneath our shoes, there must be at least some bacteria picked up from the floor, so every time we step on something, we are placing bacteria on it.

III. Introduction:

(State at least three important concepts that relate to the question stated in step one. You may find ideas in the following paragraphs but you should state at least one idea that you discovered through your own research.)

IV. Hypothesis:

V. Materials:

1. Nutrient agar plate (petri dishes)
2. China marker
3. Applicator swabs

VI. Procedures:

- a. Be sure to follow sterile techniques during this lab so that contamination doesn't occur and ruin the results of this lab.
- b. Using the china marker, draw a line on the bottom of your nutrient agar Petri dish dividing it in half. Number each half with a different number.
- c. As a class you will select two microhabitats in the school to test for the presence of bacteria.
- d. Record the characteristics of each microhabitat you're assigned in your data table. Identify characteristics of this microhabitat and record in your data table. (Ex: wet or dry, light or dark, clean or dirty, isolated or high-traffic, etc.)
- e. Complete these steps with each microhabitat all the way through one at a time. With a sterile applicator stick, swab only the given microhabitat at the place it would be most susceptible to bacteria.
- f. Streak the swab across the center of the nutrient agar plate section in a straight line, beginning and ending about 2cm from each edge of the dish. Do not break through the nutrient agar. Try to keep each streak mark the same size. Remember, you will be applying two different streak marks from two different microhabitats to each side of the nutrient agar plate. Keep the cover off the dish for as little time as possible.
- g. Discard the applicator stick in the manner instructed by Mrs. L.
- h. Repeat steps 4-6 for the other microhabitat.
- i. Mrs. L. will leave one dish untouched as a control.
- j. Place your petri samples on the class tray for incubation.
- k. Record the growth of the microorganism on each plate in both qualitative and quantitative terms in the data collection section of this lab.

Experimental Components: Fill this out once your experiment is set up.

Independent Variable: _____

Dependent Variable: _____

Experimental Control: _____

Constants: _____

VI. Data:

Observations: _____

Petri Section	Microhabitat	Microhabitat characteristics:	Amount of bacteria 10-numerous/1-very few
1			
2			

Follow up

1. Why was it important to keep the agar plates uncovered for as little time as possible?
2. Why was it important to observe sterile methods and use a new, sterile swab for each different microhabitat?
3. Early biologists grew bacteria on freshly cut slices of vegetables. Why would it be important to have "freshly cut" vegetable slices?
4. Which microhabitat seemed to result in the most bacterial growth?

5. Aside from the control, which microhabitat seemed to result in the least bacterial growth? Why?

7. When you have a throat swab taken in a doctor's office, is it necessary to prepare a "control" culture each time?

8. Complete the chart below using classmates' data. We will do this as a class. Graph the different locations using graph paper. What conditions seem to promote the growth of bacterial in a microhabitat?

Petri Section	Microhabitat	Microhabitat characteristics:	Amount of bacteria 10-numerous/1-very few
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

