Predicting the Growth of Microorganisms
Student Worksheet

Problem: Where in our environment do we find microorganisms?

General Procedure and considerations:

1. Using sterile plate of nutrient agar—a gel growth medium used by scientists to culture microorganisms, you will design an experiment that will allow you to compare the presence of microorganisms on surfaces at various locations around our school.
2. Choose a location to study, such as the handles in the bathroom stalls, the classroom doorknob, the telephone handles, etc.
3. In order for our results to be reliable, what conditions must we control? How will we set up the control?
4. Formulate a hypothesis. Predict which location out of all the locations being tested will have the most microorganisms, and which will have the fewest microorganisms.
5. What kinds of observations will be necessary to test our hypothesis? What will we measure and how will we measure it?
6. How will you record this data? Create a data table to use in the experiment.
7. **Be sure your teacher approves you experimental procedure before you begin.**

Test Location: _____

Hypothesis:

_____

_____

_____

Materials (per team of 2 students):

2 sterile nutrient agar plates
Sterile water
Clear tape to seal your Petri dishes
2 sterile swabs

Procedure:

Write out your step-by-step procedure below. As you complete your experiment, indicate any ways you altered your procedure.

_____

_____

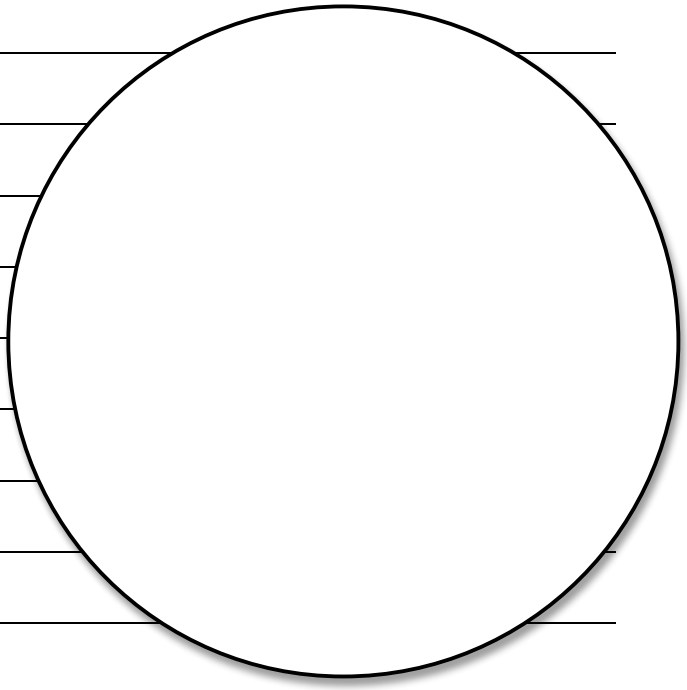
_____

_____

Education and Research: Testing Hypotheses

Results:

Record your results here. You should include a drawing of any growth on your plate in the spaces provided. You should also describe, in detail, the **number, size, position, color, and shape** of any growth on the plate, as well as any other observations not listed above.



Analysis:

1. **Examine the growth on your classmates' dishes, from various locations.** How did the growth of the microorganisms vary with location? Give some specific examples to illustrate your observations.

2. How did your results compare with your predictions? Using your knowledge of microorganisms, explain any difference between your predictions and your results.

3. Why did we need to swab our "control" dish with the sterile water?

4. Did the control work effectively? If not, why not? How would you correct for this in the experimental procedure?

5. Why did we have to provide *nutrient* agar for this experiment?

6. Why did the agar plates need to be incubated? Why did the agar plates need to be incubated upside-down?

7. What changes in your hypothesis or refinements of your experimental procedure might you suggest?

Conclusion:

Based on your results, what can you conclude from this experiment?