Experimenting with Bacteria

3/12

Integrated Science 2

Redwood High School Name Per:

■ Introduction

Bacteria are prokaryotic organisms that play important roles in the living world. Some bacteria are harmful pathogens that cause disease in humans, while others are helpful organisms that provide benefits for both humans and the environment. In this activity you will design and conduct an experiment using bacteria and then write a formal Laboratory Report describing the experiment.

■ Procedures

DAY 1: Sampling, and Spreading Practice: ***follow procedures demonstrated for you by your teacher***

• samples (one loci per student) incubated overnight at 37°C

DAY 2: Observing Growth and Designing your Bacterial Growth Experiment

Tasks: 1. Observe the bacterial growth on your Petri dish.
2. Create a Laboratory Notebook Entry on a separate sheet of paper.
Note color, texture, shape, and thickness of the colonies.
3. Subculture one loci to be incubated for 24hrs at 37°C [subculture = transfer from agar to liquid medium]
4. Design an experiment with your lab partners to investigate bacterial growth

Title of Laboratory Experiment: *Experimenting with Bacteria– Inoculation practice*
Date: *What is today's date?* Time: *What time of day did you complete this portion of the experiment?* Environmental Conditions: *What is the temperature? Are you inside or outside? Is it sunny? windy? etc.* Task(s): *What did you, the experimenter, do today in reference to this experiment?* Observations: *What did you, the experimenter, observe today in this experiment? Use descriptive words and drawings.*

Designing the experiment:

- Discuss ideas for your experiment among your table group.
- *Decide which inhibitor each student is going to be responsible for bringing*
- Complete an Experimental Organizer for your proposed experiment.
- Obtain teacher approval for your inhibitors.
- Sketch data tables (final draft required on day 4)
  - create space to draw the petri dish, and space to record "Zone of Inhibition" in mm

DAY 3: Conduct your experiment. ***Follow procedures demonstrated for you by your teacher***

Task: 1. Carry out your approved experiment.
2. Finalize data tables to use to record your results
3. Begin to conduct research about your experiment to use in your introduction

DAY 4: Observe bacterial growth and record results.

Tasks: 1. Record data about your Petri dishes on the **Data table** you constructed. Data should also include drawings that illustrate the correct size and position of the colonies as you observed them on the Petri dish.
2. Create a Laboratory Notebook Entry on a separate sheet of paper.
3. Write a Formal Lab Report [**due date to be announced in class**]

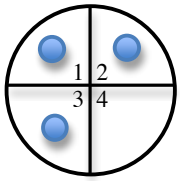
■ Guidelines for inoculating the Petri Dish, placing the Inhibitors and incubating bacteria

1. Preparing the Petri Dish
NEVER OPEN A STERILE PETRI DISH UNLESS ABSOLUTLEY NECESSARY (AS IN PART OF AN EXPERIMENTAL PROTOCOL) – OTHERWISE STERILITY MAY BE COMPROMISED

2. Inoculating the Petri Dish

- Using a marking pen label the outside edge of the bottom of your Petri dish with your names and period. write small
- The Petri disk has already been divided into 4 quadrants
- Using a plastic pipet, draw up the liquid bacterial culture until you reach the first "bump". This measures 100 μl. Dispense the liquid onto the center of your agar plate. Using a sterile spreader evenly distribute the bacterial solution over the surface of the agar. Open the dish only long enough to inoculate the agar and spread the bacteria then replace the cover. ***Place your inhibitors as described in #3 ASAP.***

3. Placing the inhibitors
• After dipping an inhibitor disk in an inhibitor, place each inhibitor disk directly on the agar in the middle one of the quadrants. The 4th quadrant remains empty, acting as a control. Record the quadrant for each inhibitor.
• Record the inhibitors on your **Data table** and here:
Quadrant 1. _____ Quadrant 3. _____
Quadrant 2. _____ Quadrant 4. no inhibitor (control)



4. Incubation
• all Petri dishes will be incubated upside down at 37°C

■ Design Outline

Title:

Hypothesis:

Independent Variable: ❒ Continuous or ❒ Discontinuous

Levels of the I.V. (indicate control)					
# of trials you will conduct for each level					

Dependent Variables Quantitative Measurements (include units): Qualitative Measurements:

Constants: