

Name _____ Date _____ Teacher _____

Can bacteria arise from non-living things? Biogenesis – Louis Pasteur

Introduction: In this lab activity, you are going to determine if bacteria can come from non-living things. You will accomplish this task by allowing six test tubes of broth to be exposed at different levels to see if any bacteria grows and to what degree the growth has occurred.

Day 1: You will accomplish the preparation of the six test tubes of broth.

Procedure:

- 1. Label each test tube using labeling tape and marker with letters 'A', 'B', 'C', 'D', 'E' & 'F'.*
- 2. Place the test tubes in the test tube rack for later use.*
- 3. Place 10 ml of beef broth in each test tube using the graduated cylinder remembering to read the measurement at the bottom of the meniscus.*
- 4. Fill the beaker with approximately 500 mL of water then heat the water to boiling using the hot plate.*
- 5. Leave test tube 'A' unstoppered.*
- 6. Place a rubber stopper into test tube 'B' so that it is no longer exposed to the atmosphere.*
- 7. Place test tubes 'C', 'D', 'E', & 'F' in the beaker and heat them for 10 minutes.*
- 8. Carefully return the hot test tubes to the rack by using the test tube holder.*
- 9. Leave test tube 'C' unstoppered.*
- 10. Place a rubber stopper into test tube 'D' so that it is no longer exposed to the atmosphere.*
- 11. Place a sterile one-hole rubber stopper containing a piece of straight glass tubing into test tube 'E'.*
- 12. Place a plug of cotton that is covered with aluminum foil containing an 'S'-shaped glass tubing into test tube 'F'.*
- 13. Store all six test tubes in the test tube rack where your teacher tells you to place it. This should be where the test tubes will not be exposed to direct sunlight but will still be in an area that will provide warmth.*

Day 2: You will make all of your observations regarding the test tubes and the microscope slides. You will also make your conclusions from the results.

Observations:

Growth of Bacteria will cause the clear broth to become cloudy & turbid.

- 1. Make a wet mount slide for the broth from each test tube.*
- 2. Label all the slides and examine the presence or the absence of bacteria on each slide under a compound microscope at high power. (Bacteria will appear as tiny objects).*

Data recording:

1. Record your observation for each test tube in the data table (T for turbid, C for clear, TT for high level of turbidity).
2. Record your observation for each slide, B for presence of Bacteria and A for absence of Bacteria, Bb for high amount of Bacteria.
 - 1 -CA indicates no Bacterial growth.
 - 2 -CB indicates slight Bacterial growth.
 - 3 -TB indicates moderate Bacterial growth.
 - 4 -TBB indicates high Bacterial growth.
 - 5 -TTBB indicates very high Bacterial growth.

Conclusion:

Brainstorm together and focus on finding the relationship between the rate of bacterial growth and the absence or the presence of air and/or heat then draw a curve for this relationship on your graph paper.

Data Table:

Test tube A	Test tube B	Test tube C	Test tube D	Test tube E	Test tube F
Slide A	Slide B	Slide C	Slide D	Slide E	Slide F
Test tube & slide A	Test tube & slide B	Test tube & slide C	Test tube & slide D	Test tube & slide E	Test tube & slide F

Now that you have performed this experiment, do you believe bacteria can come from non-living things? Support your answer with the results from this lab activity.
