



Modeling Bacteria Growth: Doubling Bacteria

Activity Description/ Lesson Plan

Student Objective: Students will observe a pattern in the bacteria population size.

Introduction for teachers:

A single bacterium reproduces by splitting in half, creating two identical bacteria. This process is called binary fission. Over time this process continues, producing more and more bacteria. A single cycle of binary fission can happen in as little time as 20 minutes.

When discussing the growth of bacteria, we often use the model that it takes all bacteria the same amount of time to reproduce and that they are all in sync. In this basic model easily measured reproduction cycles occur.

Materials:

50+ markers per group (beans, m&m's, etc)

A sheet of paper (signifying the bacterial colony area, and to record the table of values)

Activity Instructions:

The colony begins with a single bacterium: place one marker in the colony.

During each reproduction cycle each bacterium splits in half producing one more bacterium.

Record your populations in a T-chart.

# of rep. cycles	# of bacteria
0	1
1	2
2	4
...	...

- The 1st reproduction cycle occurs. How many bacteria should be added? Add them.
- The 2nd reproduction cycle occurs. How many bacteria should be added? Add them.
- How many reproduction cycles do YOU THINK it will take to get over 10 bacteria?
Check by going through the necessary reproduction cycles.
- How many reproduction cycles do YOU THINK it will take to get over 50 bacteria?
Check by going through the necessary reproduction cycles.
- Do you see any patterns in the population size? How do you get from one population size to the next?
- How many reproduction cycles do you think it will take to get over 100? 500?