

Name: _____

Date: _____

Life Science

Period: _____

Viruses and Bacteria

mega multiples of microbes

www.microbeworld.org

Goal:

To visualize large numbers and calculate microbial population growth.

Information to Think About:

Microbes divide, forming new cells. That is, 1 cell forms 2 cells in a certain period of time that often is called a generation. Then the 2 cells divide, forming a total of 4 new cells. These 4 cells can all divide, forming a total of 8 cells. In each generation, the number of cells in the microbial population doubles.

Materials:

- 1 pencil
- 1 piece of paper
- 1 half pound bag of rice
- 1 piece graph paper
- 1 spoon
- 1 cup
- 1 calculator

Procedures:

1. Determine the number of grains of rice in a package of rice from the grocery.
 - a. Count the number of grains required to fill a spoon: _____
 - b. Using spoonfuls, determine the number of spoons of rice required to fill a small cup:

 - c. Determine how many cupfuls of rice are in the package by filling and refilling the cup:

 - d. Approximately how many grains of rice are in a half-pound package of rice?

 - e. How many packages of rice would you need to have a million grains of rice?

 - f. How many for a billion? _____

www.ShellysScienceSpot.com

2. Determine how many cells are formed from a single cell in 20 generations. Do this on a separate sheet of paper by:
 - a. Beginning with 1 cell and doubling it (multiply by 2) – this is the first generation.
 - b. Multiply the number 2 by 2 for the number of cells at the end of the second generation.
 - c. Multiply this number by 2 to determine the number for the third generation.
 - d. Continue with this process until you arrive at the 20th generation: _____
 - e. Compare your numbers with those obtained by the others in your group. Correct any mistakes.

3. Calculate the number of individuals produced after 40 generations, using the same method.

4. Graph the information that you obtained from the 1st, 20th and 40th generations.

5. What conditions might affect the number of individuals in microbial populations?

What did you find out by doing the activity?

Before doing “Mega Multiples of Microbes”, did you know:

- | | | |
|--|-----|----|
| • the huge numbers you must use to count microbes? | Yes | No |
| • how these large numbers in microbe populations are calculated? | Yes | No |

Conclusion questions

Answer the following questions in complete sentences, on a separate piece of white lined paper.

1. How are the sizes of microbe populations calculated?
2. How is the growth rate of microbes calculated?
3. What happens to older cells as the new cells continue to multiply?