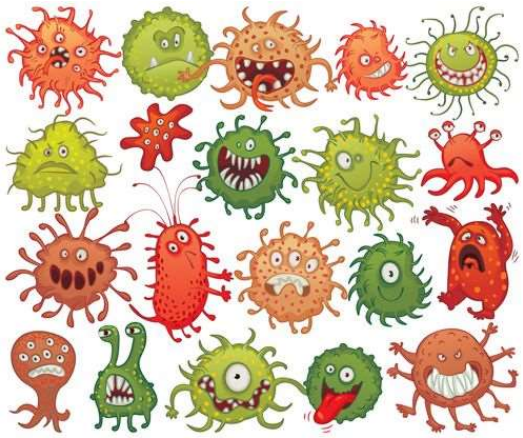
Science 9

The Growth of Bacteria

Name:
Date:
Block:



Bacteria reproduce by a process called binary fission. It is a process that allows bacteria to divide once about every 20 minutes under ideal conditions. In this exercise, you will simulate the growth of bacteria over 10 generations.

In this exercise, the bacteria will reproduce under ideal conditions. Therefore, they will double their numbers every generation. To visualize this growth, we will record their growth numerically and visually. Afterwards, we will represent the growth on a line graph.

We will start with one bacterium and see how many bacteria will be reproduced after 10 generations.

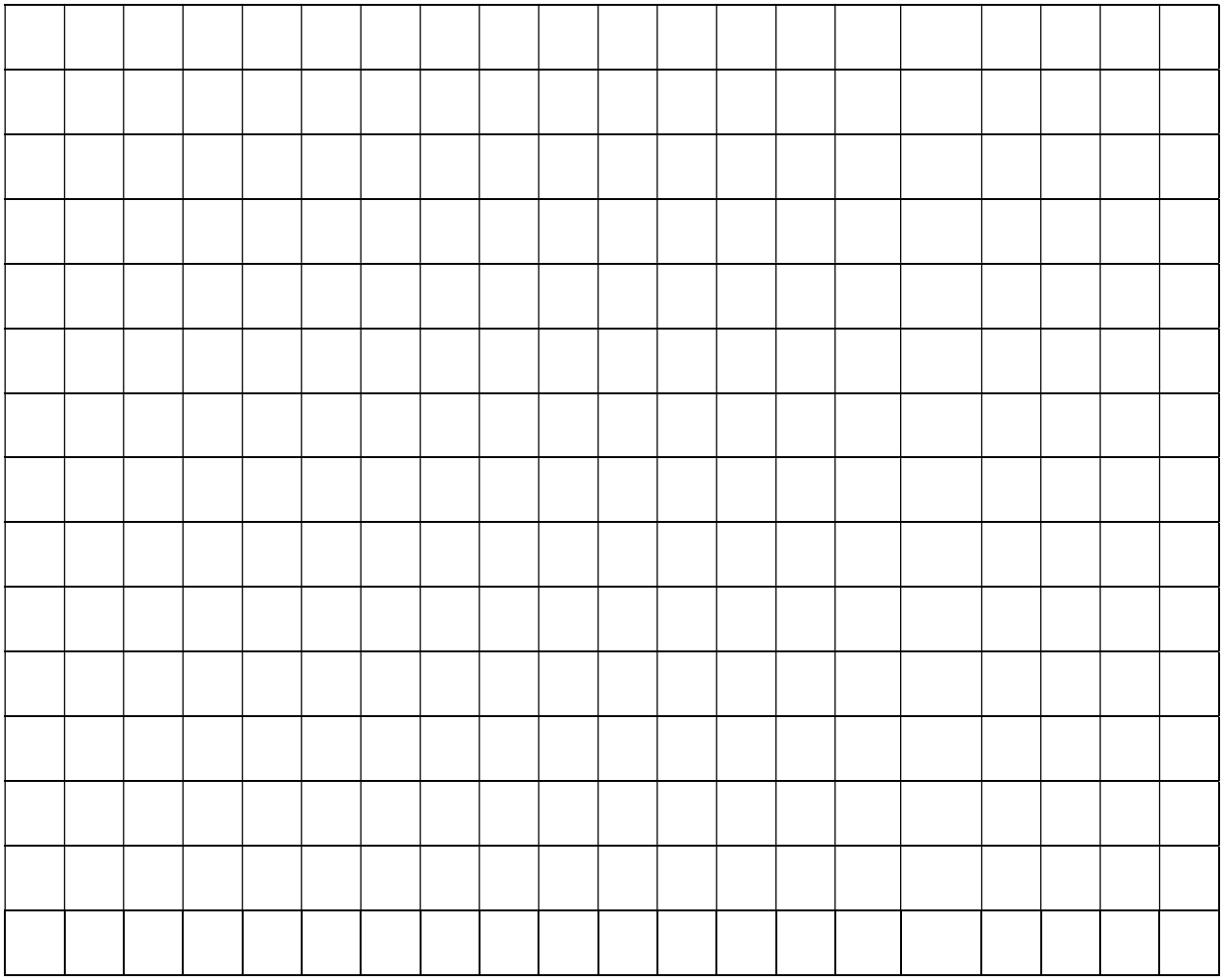
Directions:

1. Obtain a cup containing popcorn kernels from the front of the class.
2. Take one popcorn kernel out of the cup and set it down onto your desk. This will be the parent bacterium and the first generation of your bacterial population.
3. Multiply this population by two. This means in the second generation, you will have two bacterium in the population. Record this information in your data table.
4. Repeat step 3 and continue to record the size of your population until you have reached a minimum of 10 generations or until all the corn in your cup is gone.
5. Make a graph of your results. The generation should be in the horizontal x-axis and the size of the population should be on the vertical y-axis. Be sure to include a scale, title, and label your x and y-axis.

Data Table:

Generation	Time	Population Size	Generation	Time	Population Size
1st	0 min		6th		
2nd	20 min		7th		
3rd			8th		
4th			9th		
5th			10th		

Graph:



Conclusion:

1. How is this activity similar to binary fission?

2. What is the population size of your population after 10 generations have passed?

3. The curve on your graph represents exponential growth. How would you describe the growth of the bacteria at the beginning of the activity compared to the end?

4. What is the population size of your population after 15 generations? Be sure to show how you got your answer.

5. If it takes 20 min for your bacteria to divide, how long would it take for your population to reach 10 generations? Be sure to show how you got your answer.

6. Predict in terms of minutes or hours how long it would take before the population of bacteria to reach 1,000,000. Be sure to support your response.

7. Normal cells in your body do not show this kind of growth. However, cancer cell growth resembles exponential growth. Why do you think this is detrimental for a living organism?