

**CHAPTER**  
**12** **Project Recording Sheet**  
**Sequences and Functions**

**Addition by Division**

Bacteriologists study the growth and characteristics of microorganisms, the way they interact with their environment including human beings.

Bacteria are one-celled organisms which grow in number by the division of individual cells. Although some bacteria create illness and even death in people, bacteria have important roles in many natural cycles. How long it takes a bacteria population to grow depends upon factors such as temperature and nutrient supply. Doubling time is the time it takes a population to double at a constant rate of growth. The number of bacteria is  $2^n$  where  $n$  is the number of times the population has doubled.

<b>E. coli bacterium</b>	
<b>Conditions</b>	<b>Doubling Time (min)</b>
Optimum temperature (37°C) and growth medium	20
Low Temperature (below 37°C)	40
Low Growth Medium	60
Low Temperature, Low Growth Medium	120

<b>B. anthracis bacterium</b>	
<b>Conditions</b>	<b>Doubling Time (min)</b>
Optimum temperature (37°C) and growth medium	45
Low Temperature (below 37°C)	75
Low Growth Medium	90
Low Temperature, Low Growth Medium	120

Create a graph that compares the growth of E. coli and B. anthracis for 12 hours under optimum conditions. Extend the curves to estimate the differences in the numbers of bacteria after one day.

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**Research:** What other things can you discover that show geometric sequences of growth?

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