

You have solved problems that can be represented by a straight line on a graph. These problems can be written in the form $AX + BY = C$, and do not involve exponents. When amounts in a problem increase exponentially, we get a very different kind of graph.

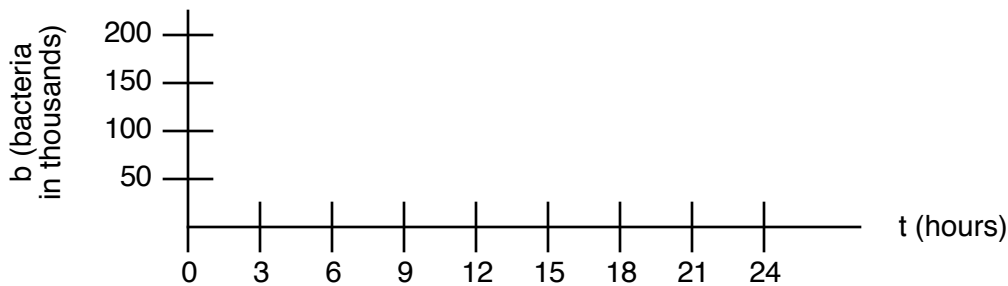
Follow the directions to make a graph of an exponential increase.

- 1) A scientist starts with 1000 bacteria in a dish. The number of bacteria doubles every 3 hours. Fill in the missing values to make a chart of the first 24 hours of bacterial growth.

t (hours)	0	3	6	9	12	15	18	21	24
b (bacteria in thousands)	1	2	4						

Notice that, starting with 2, each value of b can be written as 2 with an exponent.

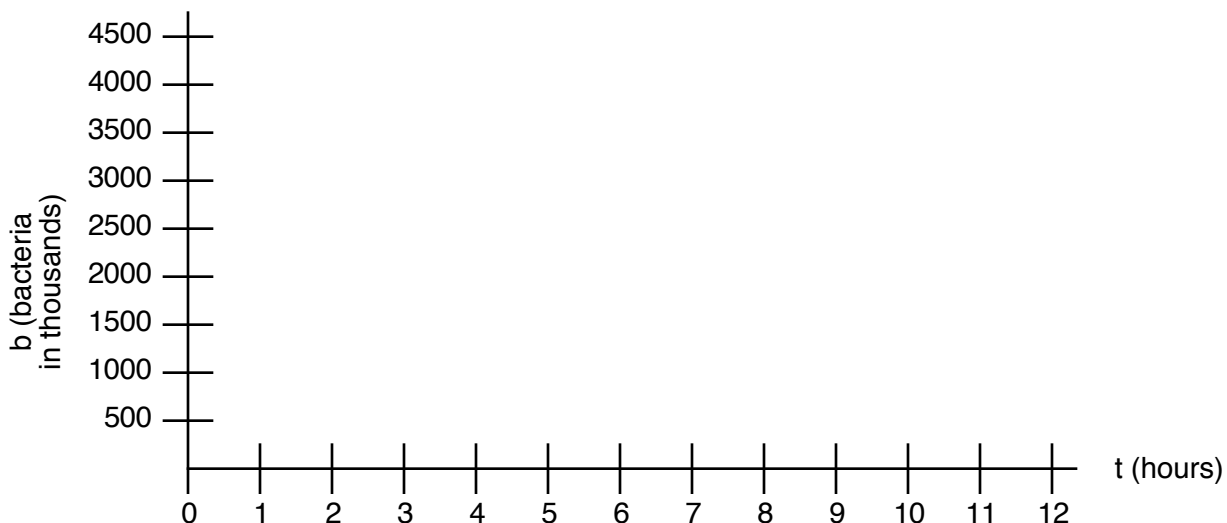
- 2) Plot the points from the chart on the graph below and connect them with a curved line showing the growth in numbers of bacteria. (Estimate the location of the value of b for each point.)



- 3) A new bacterial culture also begins with 1000 bacteria. This time the number of bacteria doubles every hour. Make a chart for the first 12 hours. How many bacteria will there be after 12 hours?

t (hours)	0	1	2	3	4	5	6	7	8	9	10	11	12
b (bacteria in thousands)	1	2	4										

- 4) Plot the points from the chart on the graph below and connect them with a curved line.



- 5) As values increase exponentially, what do you notice about the rate of increase over time?