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The patterns in spread of good deeds by the Pay It Forward process occur in other quite different situations. For example, when bacteria infect some part of your body, they often grow and split into pairs of genetically equivalent cells over and over again.

a. Suppose a single bacterium lands in a cut on your hand. It begins spreading an infection by growing and splitting into two bacteria every 20 minutes.

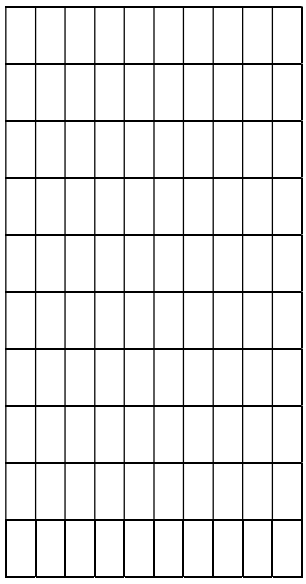
i. Complete a table showing the number of bacteria after each 20-minute period in the first 3 hours.(Assume none of the bacteria are killed by white blood cells.)

Number of 20- min periods	1	2	3	4	5	6	7	8	9	10
Bacteria Count	2	4	8	16	32	64	128	256	512	1024

ii. Plot the *(number of time periods, bacteria count)* causing the infection.

Bacteria Count

(Go up by 110 every time)



# of 20 min periods

(Go up by 1 every time)

iii. Describe the pattern of growth of bacteria causing the infection.

As x increases by 1 Y doubles every time.

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b. Use Now and NEXT to write a rule relating the number of bacteria at one time to to the number 20 minutes later. Then use the rule to find the number of bacteria after fifteen 20-minute periods.

Start @ _1_ ***Next=*** _Now x 2_

Number of bacteria after fifteen 20-min periods = _32768_

c. Write a rule showing how the number of bacteria *N* can be calculated from the number of stages *x* in the growth and division process.

N= _2^x_

d. How are the table, graph, and symbolic rules describing bacteria growth similar to and different from the Pay It Forward examples? How are they similar to, and different from, typical patterns of linear functions?

The bacteria involves time.