



# Outbreak!

Student Activity

Name \_\_\_\_\_

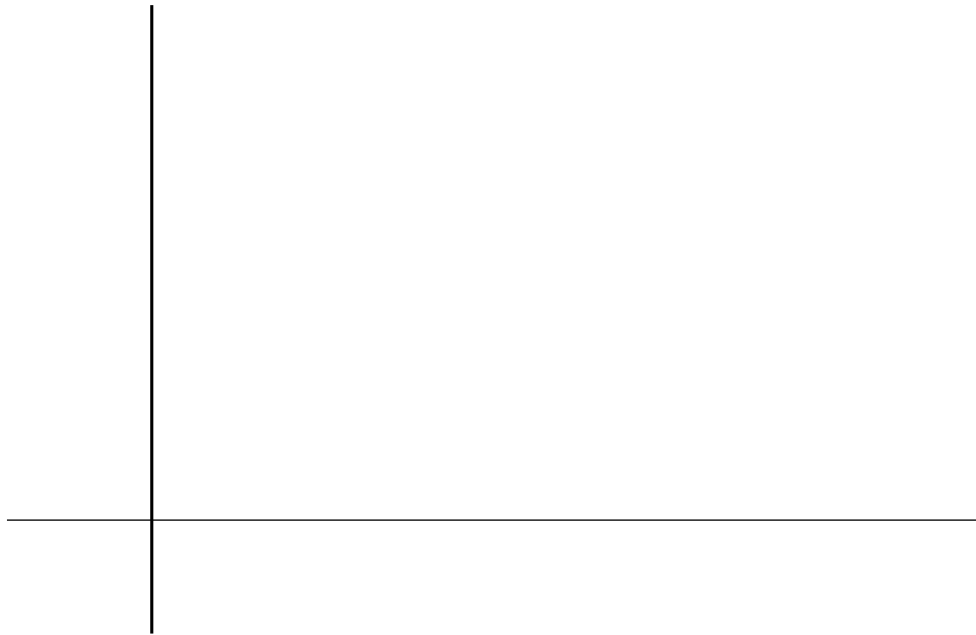
Class \_\_\_\_\_

The health clinic at a large school district has become concerned. It is apparent that there is an outbreak of a flu epidemic. To the right is a table indicating the number of new cases of the illness for each day according to health office records for the last five days.

Day	Cases
1	2
2	6
3	18
4	54
5	162

Record this data in **L1** and **L2**.

1. Press  $\boxed{2nd} \boxed{y=}$  and construct a scatter plot using the data you placed in **L1** and **L2**. Sketch the graph displayed on your calculator below.



2. Describe the rate of change observed in the data and corresponding graph.
3. What term describes the type of sequence displayed in the “students” data column?
4. Identify a term other than scatter plot that describes the type of graph.
5. How many students would you expect to come down with the illness on day 6?



6. Assuming that this pattern will continue, develop an equation that will relate the number of students,  $y$ , to any day,  $k$ .

7. How many students total will have been affected by day 5?

Summation (sigma) notation may be used to make the previous calculation easier to perform. An example is:

$$\sum_{k=1}^5 2^k = 2^1 + 2^2 + 2^3 + 2^4 + 2^5$$

The expression  $2^k$  is evaluated for each integer from 1 to 5 and the results are added.

8. Using summation notation, write and evaluate an expression that may be used to determine the total number of students affected in 5 days.

9. Develop a generalized summation notation expression that can be used to determine the number of students affected after any number of days,  $n$ , assuming that this pattern will continue.