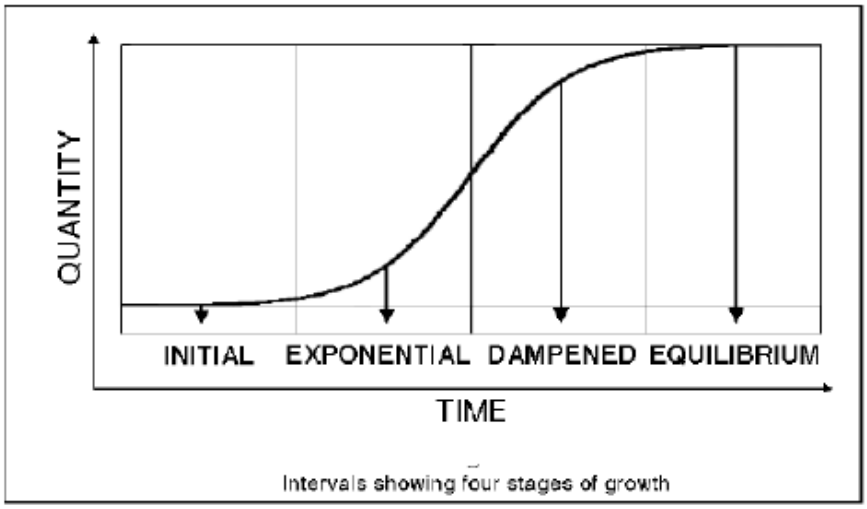
H1N1—two letters and two numbers—are memorable as the most recent and perhaps greatest public health concern of this decade. The outbreak of this strain of influenza as most similar outbreaks can be simulated using mathematical techniques and models you are familiar with.

The four stages of are labeled in the following graph. Remember the scenario you are considering here—the spread of the flu virus.



Intervals showing four stages of growth

1. What is happening with the spread of the flu virus in the graph?

Imagine a total population of 100 individuals. Each number from 0-99 in the Hundreds Chart represents an individual, with the number 0 used to portray the original host. Use the Hundreds Chart to keep track of the infected individuals by crossing off their number on the list as they become infected.

Hundreds Chart

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

Day 1: The original host infects a person represented by a randomly generated number. Generate a random integer between and including 0 and 99 using your graphing calculator or some other random number generating tool. Mark that person in the chart.

Day 2: The two infected people from Day 1 now infect two people, so generate two random integers.

Continue to simulate the rest of the days, completing the table of data up to Day 6.

2. Make a scatterplot of days 1-6 using your graphing calculator. Write your window below and sketch the graph

Xmin=
Xmax=
XScl=
Ymin=
Ymax=
Yscl=
Xres=

3. Find a regression model to model the data
a) what model would you use?
b) Write the equation:
c) Plot the equation in your y= of your graphing calculator and sketch the result above.

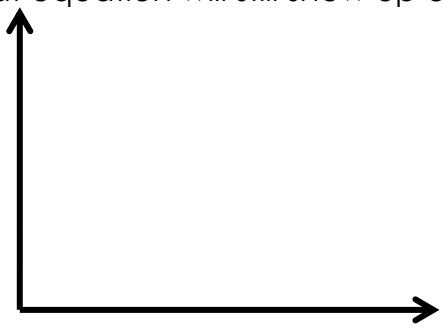
4. Using you model, predict the amount of people that will be infected in day 10.
a. Is that a realistic number? Why or why not?

b. Based off your answer in part 4a. what can you predict about the spread of the virus?

CONTINUE THE SIMULATION FOR DAYS 7-9

5. Add the days onto your scatter plot. Update your window and sketch the new graph. Don't forget to clear out you "y =" otherwise that equation will still show up on your graph

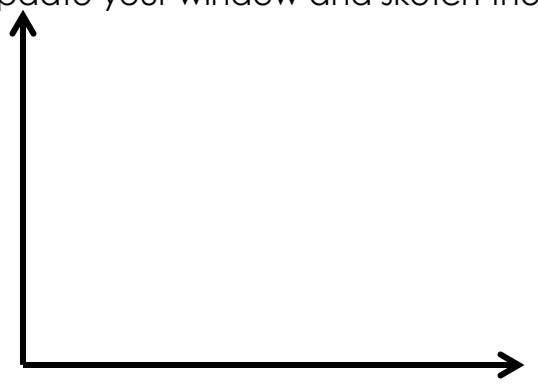
Xmin=
Xmax=
XScl=
Ymin=
Ymax=
Yscl=
Xres=



FINISH THE SIMULATION TO DAY 15

6. Update your scatter plot for all of the data. Update your window and sketch the graph below

Xmin=
Xmax=
XScl=
Ymin=
Ymax=
Yscl=
Xres=



7. This is called a **logistic graph.** Do a logistic regression model and write the equation below. Sketch the model over your scatter plot from number 6.

DAY **(x)**	Number of initially infected people	Number of newly infected people	Total number of infected people **(y)**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			