

# Survivor Lab

## *Exponential Modeling*



Name \_\_\_\_\_

### **Materials:**

- One die per person
- Graphing Calculator

**Scenario:** You are on a desert island and you have come in contact with a rare disease. You are exposed to the disease by the people on the island with you. Only one of you on the island will survive this disease because of the immunity that is already in your system. Which one of you will survive this disease and be on the island alone?

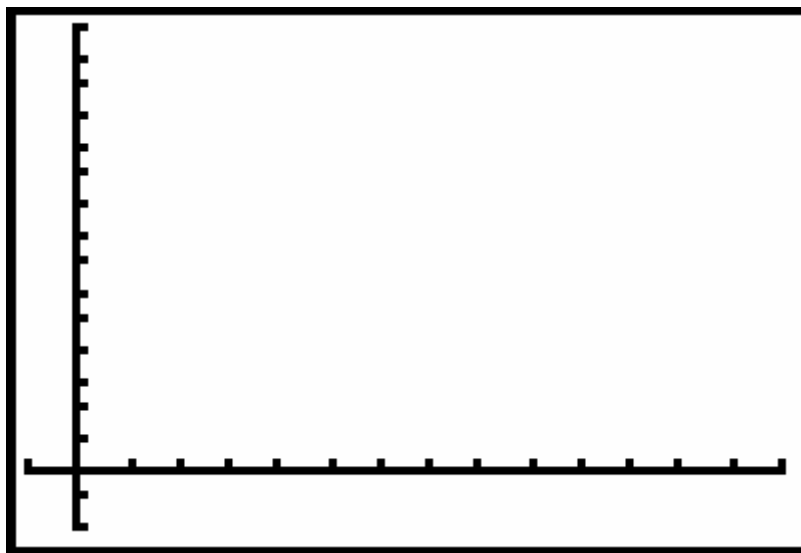
**Activity:** Dice will be used to simulate the spread of the disease. Everyone gets a die and stands up. When told to “roll”, everyone rolls the die to determine his/her survival from this exposure. You escape the disease, and remain standing, if you roll a 1 through 5. If you roll a 6, you die from the disease and sit down. Once you are dead, you cannot roll the die again. This process continues until only one survivor remains standing.

### **Data Collection:**

1. For each exposure, record the number of the exposure and the number of people still living. Record this information in the table below. This process may require more, or less, than the 14 exposures listed in the table.

Exposure	Number of People Living
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	

2. Enter the number of the exposure into  $L_1$  and the number of people into  $L_2$ .  
(Stat – Edit – enter values into lists)
3. Set up your StatPlot for a scatter plot. (Be sure to clear  $Y_1$ .) Use ZoomStat.
4. Return to the “home” screen (2<sup>nd</sup> Quit) Be sure your Diagnostics are turned on.
5. Choose the regression model which best models this data.  
(Stat–Calc–choose model)
6. Graph the data in the box below. Be sure to label axes, window and scale.



**Follow-Up Questions:**

1. What mathematical model best simulates this data? \_\_\_\_\_
2. Write an equation to fit the model \_\_\_\_\_
3. What is the correlation coefficient that corresponds with your model? \_\_\_\_\_  
Explain the correlation coefficient in relationship to the model \_\_\_\_\_  
\_\_\_\_\_
4. If there were 10 people alive, what exposure number corresponds to this number alive? \_\_\_\_\_
5. Based upon your model, at the 2<sup>nd</sup> exposure, how many people were still alive? \_\_\_\_\_
6. Why must one person survive the disease on this island? \_\_\_\_\_  
\_\_\_\_\_