TV Survivor Lab

Exponential Modeling

Name_____

Materials:

One die per person
Graphing Calculator

Scenario: You are a contestant on a TV Survivor show. Along with your fellow tribe members, you will be living on a secluded island and will be facing numerous challenges. Each week, the tribe votes to remove the contestant whom they feel has not adequately met the challenges of island life. Eventually, only one of the tribe members will remain on the island and will win a large monetary prize. Which one of you will be the ultimate survivor?

Activity: Dice will be used to simulate the voting to remove contestants each week. Everyone gets a die and stands up. When told to "roll", everyone rolls the die to determine his/her removal from the island for that week. You will remain on the island if you roll a 1 through 5. If you roll a 6, you must extinguish your torch and leave the island (and sit down). Once you are removed from the island, you cannot roll the die again. This process continues until only one ultimate survivor remains standing.

Data Collection:

1. For each week, record the number of people still remaining on the island. Record this information in the table at the right. This process may require more, or less, than the 17 weeks listed in the table.

2. When the table is complete, grab your graphing calculator.

3. Enter the number of the week into $\mathbf{L_1}$ and the number of people into $\mathbf{L_2}$.
(**Stat** – **Edit** – enter values into lists)

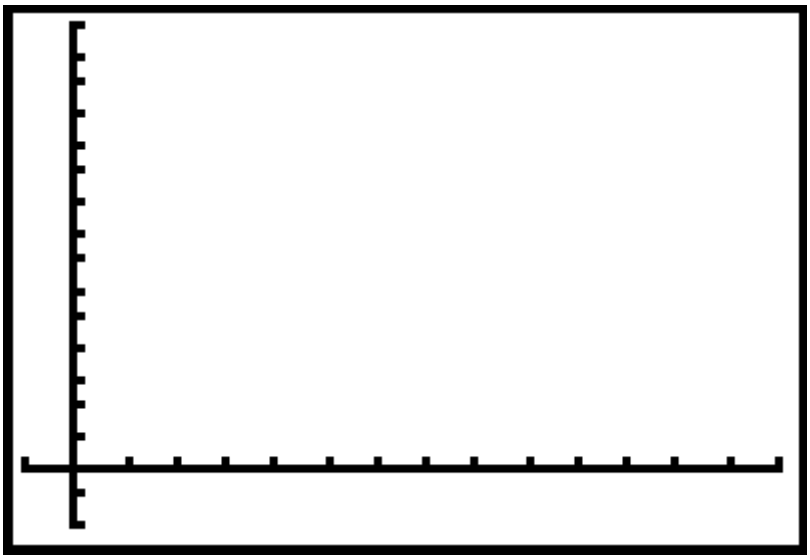
4. Set up your **StatPlot** for a scatter plot. (Be sure to clear $\mathbf{Y_1}$.) Use **ZoomStat.**

Week	Number on Island
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

5. Return to the "home" screen (**2nd Quit**). Be sure your Diagnostics are turned on.

6. Choose the regression model which best models this data.
   (**Stat**–**Calc**–choose model)

7. 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?_____
   What is the coefficient of determination for your model?_____
   Do you consider this model to be a "good fit" for your data? _____ Explain. ____
   _____

4. If there were 10 people remaining on the island, what was the corresponding week number? _____

5. Based upon your model, at the 5th week, how many people were on the island?____

6. If contestants were removed from the island every half week, how many survivors would be left on the island at the 4.5 week mark?_____