Modeling Exponential Decay

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Students roll forty 10-faced dice twenty times.

Rolling Dice Experiment

Roll forty, 10-sided dice. Remove the dice that land with a 1 on top. Repeat this over and over. Record the results of your experiment in the second column in the table. Calculate and record the class average in the third column and generate a theoretical data set in the fourth column.

How many dice are left?

Number of Rolls	Dice Remaining (Your Data)	Dice Remaining (Class Average)	Dice Remaining (Theoretical Model)
0	40	40	40
1			
2			
3			
4			
5			

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- Analyze the basic characteristics of their graphs;
- Interpret the independent and dependent variables;
- Interpret the domain and range of the function;
- Determine the continuity or discreteness of the function;
- Consider the existence of x- and y-intercepts; and
- Derive a function that best represents the relationship between the two variables.

But, wait, there's more …

1. Each group receives a set of forty, *n*-sided objects, $n \neq 10$ (e.g., coins, m&m's, dice).
2. Before conducting the experiment, each group must determine a theoretical model that will be consistent with the experimental data to be generated.
3. Students conduct the experiment using their assigned set of forty, *n*-sided objects, and compare and contrast the experimental data with their theoretical model.
4. Data for any value of *n* can be generated via computer simulation (for example, using Excel). Such a simulation can provide additional material for discussion of the consistency of an exponential model with experimental results.

Thank you!

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