

Probability Distributions – Introduction Activity

Name: _____ Date: _____

Activity:

Inside the envelope there are 5 different letters, the letters range from A to E. Without looking at the cards place them in a hat, bag or other container and randomly draw cards. Keep a tally of the number of times each letter comes up.

* Perform 50 trials. (you will also collect data from other students with the same envelope code to include in your totals.)

Purpose:

1. Learn to determine and plot probability distributions.
2. To compare the empirical probability distribution from this experiment and with the theoretical probability distribution.

PART A: Empirical Probability

Envelope: _____

Letter	Tally	Your Tally total	Total from other groups	Grand total	Probability
A					
B					
C					
D					
E					

Total # of trials (yours plus other students with the same envelope code) = _____

Analysis

1. Create a column / bar graph. Put the probability on the y-axis and the Letter on the x-axis. The graph you have is called a **probability distribution**. Label the axes and put a descriptive title. Copy and paste the graph into a Word document.
2. Clearly title the word document and put your name and date. Label all sections clearly. Answer the following questions in complete sentences.
 - a) What value would you expect to get if you added up the probability of each outcome from the distribution? Explain.
 - b) Add up the probabilities of each and comment on your result. Why might it differ from your expectations?

PART B: *Theoretical Probabilities*

1. Look at the letters in your envelope. Use the table below to determine the theoretical probability of selecting a certain letter at random.

Letter	Probability
A	
B	
C	
D	
E	

2. Plot the **theoretical probability distribution** (column graph) of picking these letters at random.
3. Copy and past the graph into a document you have created. Answer the following questions.
 - a) Describe any differences between the theoretical and empirical probabilities you have calculated and explain why they might exist.
 - b) What value would you expect to get if you added up the probability of each theoretical outcome from the distribution?
 - c) Add up the theoretical probabilities of each and comment on the result.