AP STATS Project on Chapter 6 and 7 Name_____ Pd __

Part 1: The classic probability birthday problem

A. Question: What is the probability that at least 2 students have the same birthday?

Hint: What is opposite of this event? What is the probability of the opposite event?

B. Now find the actual data for the class – how many birthdays (dates) are shared by 2 or more students?

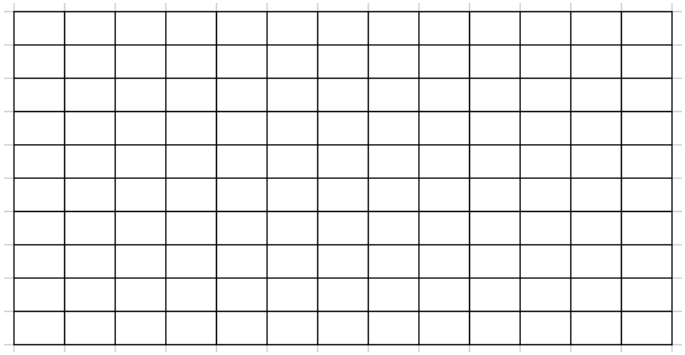
Part 2: Statistics in the News

Think of a topic related to public health (examples: vaccination rates, MRSA infection rate, etc.) and find an article or website that describes the proportion of people meeting the criteria in the USA.

C. Article Summary and Source:

D. Calculate the probability for our class for the number of student equal to 0 through 20 that meet the criteria. Example: if the rate of vaccination for Measles, Mumps, and Rubella (MMR) is .97, then what is the probability that 0 students in our class are vaccinated, 2 students, etc.

Students	Probability
0	
2	
4	
6	
8	
10	
12	
14	
16	
18	
20	



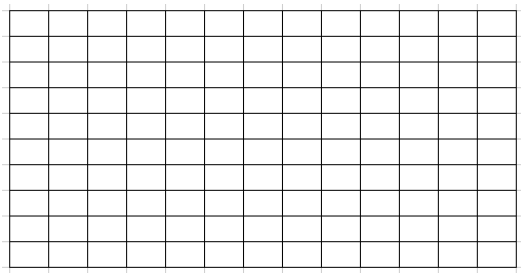
Draw a histogram for the probabilities above

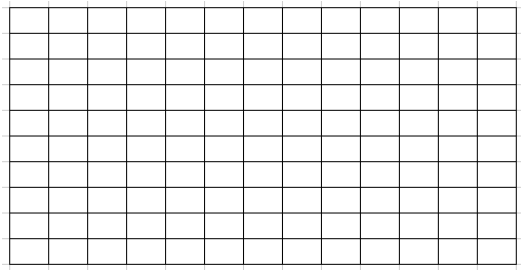
E. If we select students at random, then what is the probability that we have to draw at least 4 students before we find a success?

Part 3: A Deck of Cards

In a standard deck of cards, there are 26 red cards and 26 black cards. You will be drawing 3 samples of 20 cards and recording the number of red cards and the mean of the numbers on the cards. After you collect your samples, record the data from the other groups in the class to increase the sample size. Note: Ace = 1, Jack = 11, Queen = 12, King = 13

Sample	Reds	Mean of #'s
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		





Draw 2 histograms above

E. Proportion of reds p = $\hat{p}$ = $\sigma_{\hat{p}}$ = Use formulas, not APStat Basic Statistics

F. Mean number μ = $\bar{x}$ = $\sigma_{\bar{x}}$ =

Describe the distribution of the histogram of proportions and the histogram of means:

Proportions	**Means**
G. Center	Center
H. Shape	Shape
I. Spread	Spread
J. Outliers	Outliers

K. Does this represent a sampling distribution? Why?

L. Have we met the conditions to use the standard deviation values above? Show work.

M. Have we met the conditions to use a normal distribution to make approximations?

N. Find the probability of drawing a sample with fewer than 2 red cards (Use normal approx.)

O. Find the probability of drawing a sample with an average of 5 or less? (Use normal approx.)