SIMULATION

When using a **Random Digit Table**, you will look at every digit, or every two digits, or every 3 digits, etc. So if you are looking at

single digits, you have 10 possible 1-digit numbers: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.
two digits, you have 100 possible 2-digit numbers: 00, 01, 02, …., 98, and 99.
three digits, you have 1000 possible 3-digit numbers: 000, 001, 002, …., 998, 999.

The key to assigning numbers to your possible outcomes of your random variable is to ***use only the numbers that you need*** like matching the percent/proportion of outcome occurrence.

COMMUNICATION of SIMULATION process

Graders will be looking for your **SCHEME**. What's scheme? Scheme informs the grader how you used the table.

Did you start on Row 23 and read every 2-digits from left to right like a reading a book?
Did you ignore any numbers? If so, which ones.
What are the numbers representing?

Graders will be looking for your description of a **STOPPING RULE**. What's a stopping rule? A stopping rule indicates why you stopped carrying out the simulation.

Graders will be looking for **COUNT**. What's count? Count is a summary number calculated from your simulations used to answer a question in the problem.

Graders will also be looking for information regarding **REPLACEMENT** vs. **NON-REPLACEMENT**. Are **DUPLICATES** allowed?

CARRY-OUT SIMUALTION

☑ Underline every digit used, or every 2-digits used, or every 3-digits used, etc.
☑ Cross-out ignored numbers.
☑ Draw short line / to indicate stopping simulation.
☑ Indicate what every used number represents, W--win, M--men, F--Friday.
☑ Circle count or summary results for each simulation.

SIMULATION

OH GIRL! A couple plans on having children until they have a girl OR until they have a max of four children, whichever happens first.

SIMULATE

1. Assign the digits, 0 through 9, to represent birth of child being a boy or girl in this situation.

2. Let's mark closely on the Random Digit Table information needed when carrying out a simulation run.

Line 1:	69051	64817	87174	09517	84534
06489					
Line 2:	87201	97245	05007	16632	81194
14873					
Line 3:	04197	85576	45195	96565	68732
55259					

3. Describe how you ran the simulation using the random digit table given above.

4. Run your simulation 20 times, recording the results. Complete the table below.

X=	**1 or G**	**2 or BG**	**3 or BBG**	**4 or BBBG**	**4 or BBBB**
Tally					
P(X)					

5. What is the probability that there will be a girl in amongst the children, based on your simulation?

6. What is the probability that the couple has exactly two children, based on your simulation?

7. What is the probability that the couple has at least two children, based on your simulation?

8. What is the probability that the couple had fewer than two children, based on your simulation?

WORKING WOMEN. Assume that the percentage of women in the labor force of a large metropolitan area is 40%. A company hires ten workers, two of whom are women. Is this likely?

SIMULATE

1. Assign the digits, 0 through 9, to represent the "what' in this situation.

2. Describe how you will run the simulation using the random digit table.

3. Let's mark clearly on the random digit table information needed when carrying out the simulation with 3 runs.

17868	24943	61790	90656	87964	18883	41979	83485	46816	85435	19233
95034	05756	28713	96409	12531	42544	82853	73676	47150	99400	01927
27754	42648	82425	36290	45467	71709	77558	00095	32863	29485	82226
90056	52711	38889	93074	60227	40011	85848	48767	52573	95592	94007

4. Run your simulation 20 times, recording the results in the table below.

X=	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Tally											
P(X =)											

5. What is the probability that this would occur by chance, based on your simulation?

6. Based on your simulation, estimate the probability that this company would employ two or fewer women of ten selected, by chance?

7. Estimate the expected number of women of ten new workers this company would employ, making use of your simulation results.

8. Based on your simulation, is there a potential legal battle brewing? Justify.

STATISTICAL EVIDENCE OF DISCRIMINATION: In 1974, 48 male bank supervisors were each given the same personnel file and asked to judge whether the person should be promoted or the file held for other applicants interviewed (not promoted at this time). The files were identical except that half of them were classified as a female worker and the other half were classified as male workers. Of the 24 "male worker" files, 21 were recommended for promotion. Of the 24 "female worker" files, 14 were recommended for promotion. [B. Rosen and T. Jerdee, "Influence of Sex Role Stereotypes on Personnel Descisions," *Journal of Applied Psychology*, 59, 1974, pages 9-14]

Is this convincing evidence that the bank supervisors discriminate against female applicants? Or could the difference in the numbers recommended for promotion reasonably be attributed to chance alone? That is, there was no discrimination…it just happened that 21 out of the 35 bank supervisors who recommended promotion got files marked "male worker."

SIMULATE

1. Define the random variable.

2. Assign the digits, 0 through 9, to represent "what" in this situation described.

3. Describe how you would carry out your simulation using 35 numbers drawn from the random digit table.

4. Carry out your simulation 3 times.

19233 95034 05756 28713 96409 12531 42544 82853 73676 47150 99400

01927 27754 42648 82425 36290 45467 71709 77558 00095 32863 29485

82226 90056 52711 38889 93074 60227 40011 85848 48767 52573 95592

94007 69971

5. If the simulation was run 100 times, the following histogram displays the findings. Do you believe your simulation provides evidence that the bank supervisors discriminated against females? Use the results to argue your case.