POPULATION SAMPLING

Name:_____

RANDOM SAMPLING: Scientists cannot possibly count every organism in a population. One way to estimate the size of a population is to collect data by taking random samples. In this activity, you will look at how data obtained from random sampling compare with data obtained by an actual count.

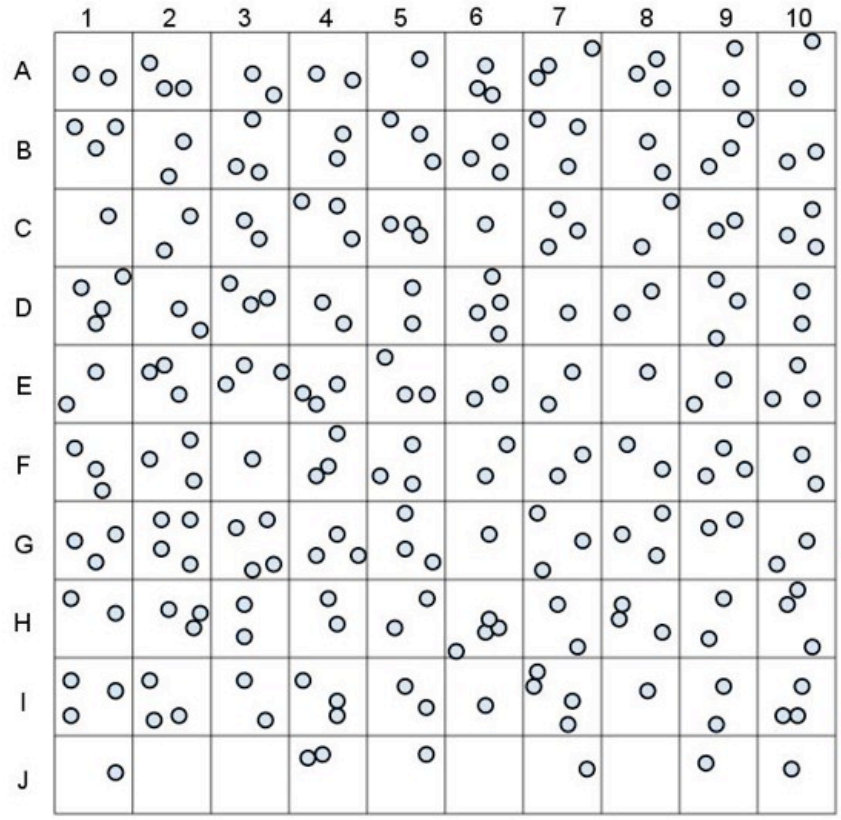
PROCEDURES:

1. Get 20 slips of paper, each approximately 4cm x 4cm.

2. Number ten (10) of the slips from **1 - 10** and put them in a small container.

3. Label the remaining ten (10) slips from **A - J** and put them in a second container.

- The grid shown below represents a meadow measuring 10m on each side. Each grid segment is 1m x 1m. Each black circle represents one sunflower plant.



4. Randomly remove one slip from each container. Write down the number-letter combination in the data table and find the grid segment that matches the combination. Count the number of sunflower plants in that grid segment. Record this number on the data table. Return each slip to its appropriate container.

5. Repeat step #4 until you have data for ten (10) different grid segments (and the table is filled out). These ten (10) grid segments represent a sample. Gathering data from a randomly selected sample of a larger area is called ***SAMPLING***.

6. Find the ***TOTAL*** number of sunflower plants for the ten (10) segment sample. This is an estimation based on a formula. ***ADD*** up all of the number of sunflowers together and ***DIVIDE*** by **ten (10)** to get an ***AVERAGE*** number of sunflower plants per grid segment. *Record this number in the table*. ***MULTIPLY*** the average number of sunflower plants by **100** (this is the total number of grid segments) to find the total number of plants in the meadow based on your sample. *Record this number in your data table.*

7. Now count all of the sunflower plants ***ACTUALLY*** shown in the meadow. *Record this number in the data table*. ***DIVIDE*** this figure by **100** to calculate the ***AVERAGE*** number of sunflower plants per grid segment.

RANDOM SAMPLING DATA		**ACTUAL DATA**
Grid Segment ***(number - letter)***	**Number of Sunflowers**	
		TOTAL **number of Sunflowers: _____** ***(COUNT BY HAND)***
		AVERAGE **number of Sunflowers** ***(divide total by 100)*** **per grid: _____**
TOTAL **Number of Sunflowers**		
AVERAGE (divide total by 10)		
TOTAL **number of plants in meadow** ***(multiply average by 100)***		

DATA ANALYSIS & CONCLUSION:

1. Compare the total number you got for sunflowers from the ***SAMPLING*** to the ***ACTUAL*** count. How close are they?

2. Why was the paper-slip method used to select the grid segments?

3. A lazy ecologist collects data from the same field, but he stops just on the side of the road and just counts the 10 segments near the road. These 10 segments are located at J 1-10. When he submits his report, how many sunflowers will he estimate are in the field? Suggest why his estimation would differ from your estimation.

4. Population Sampling is usually more effective when the population has an ***EVEN DISPERSION*** pattern. ***CLUMPED DISPERSION*** patterns are the least effective. ***EXPLAIN*** why this would be the case.

5. **CHALLENGE**: In a forest that measures 5 miles by 5 miles, a sample was taken to count the number of silver maple trees in the forest. The number of trees counted in the grid is shown below. The grids where the survey was taken were chosen randomly. Determine how many ***TOTAL*** silver maple trees are in this forest using the random sampling technique. ***SHOW YOUR FULL WORK!!!!***

	7			
				3
			5	
11		9		