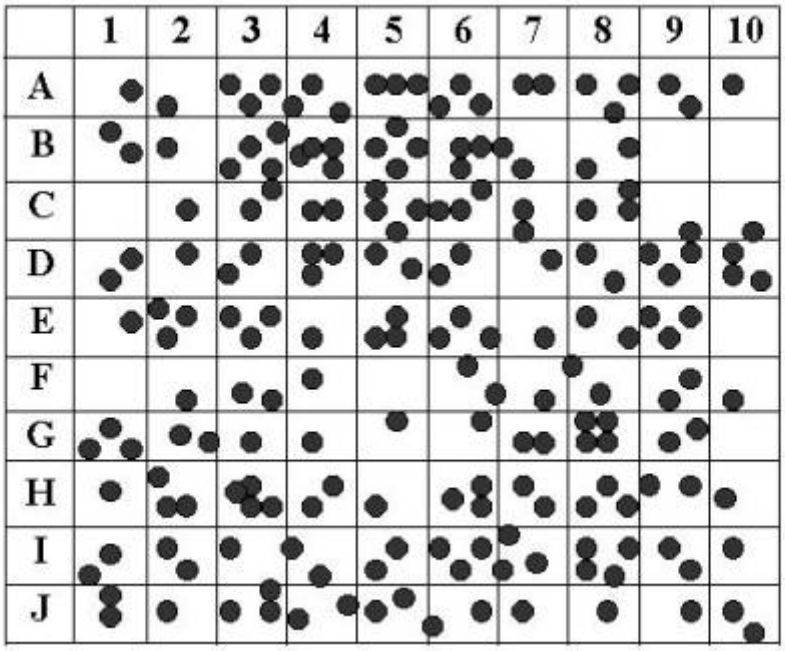
Random Sampling Lab

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.

Procedure: The procedures used in this experiment were:

1. Cut apart the table 1 – 10 making 10 slips and place these in a container.
2. Cut apart the table A – J making 10 slips and place these in a second container.

The grid shown below represents a meadow measuring 10 m 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 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 1. Return each slip to its appropriate container.
5. Repeat step 5 until you have data for 10 different grid segments. These 10 grid segments represent a sample.
6. Calculate the AVERAGE number of sunflower plants per grid segment. Record in Table 2.
7. Multiple this value by 100 (the total number of grid segments) to find an estimate of the total number of plants in the field based on your sample. Record in Table 2.
8. Now count all the sunflower plants actually shown in the field. Record this number in the data table. Divide this figure by 100 to calculate the average number of sunflower plants per each grid. Record in Table 2.

9. Calculate the percent error your estimates had. ESTIMATE population size minus ACTUAL population size. Divide that value by the ACTUAL population size. Multiply by 100. Record in Table 2.

Data:

Table 1:

Sample Number	**Grid Segment (Letter and Number)**	**Number of Sunflowers**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Table 2:

Average Number of Sunflowers Per Grid	
Estimate of Total Number of Plants in Field **(Average per grid segment x 100 segments)**	
Actual Number of Sunflowers in Field	
Percent Error	

Analysis:

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. Why do biologists use Sampling? Why can't they just go into the forest and count all the sunflower plants?

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. Describe how you would use Sampling to determine the population of dandelions in your yard.

6. 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 silver maple trees are in this forest using the random sampling technique. Show your work!

	7			
				3
			5	
11		9		

CUT APART

1	2	3	4	5
6	7	8	9	10

CUT APART

A	B	C	D	E
F	G	H	I	J