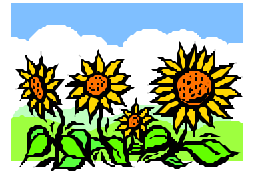


# Random Sampling Lab 1: Sunflowers



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:

1. Tear a sheet of paper into 20 slips, each approximately 4cm x 4 cm.
2. Number 10 of the slips from 1 to 10 and put them in a small container
3. Label the remaining 10 slips from A through J and put them 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.

	1	2	3	4	5	6	7	8	9	10
A	•	•	•••	••	••••	••	••	••	••	•
B	••	•	•••	•••	••••	•••	••	•	•	
C		•	•	••	•••	••	•	••	•	•
D	••	•	••	••	••	••	•	••	••	••
E	•	••	••	•	••	••	•	••	••	
F		•	••	•		•	•	••	••	•
G	••	••	••	•	•	•	••	••	••	
H	•	••	••	••	•	••	••	••	••	•
I	••	••	••	•	••	••	••	••	••	•
J	••	•	••	••	••	•	••	•	••	••

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. Return each slip to its appropriate container.
5. Repeat step 4 until you have data for 10 different grid segments (and the table is filled out). These 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 10 segment sample.
7. Add all the grid segment sunflowers together and divide by ten 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 estimated total number of plants in the meadow based on your sample. Record this number in your data table.
8. Now count all the sunflower plants actually shown in the meadow. Record this number in the data table.

### **Analysis:**

1. Compare the total number you got for sunflowers from the SAMPLING (experimental) to the ACTUAL count. How close are they?
2. Calculate your percent error between the actual and experimental values.

$$\% \text{ error} = \frac{\text{actual value} - \text{experimental value}}{\text{actual value}} \times 100$$

3. Why was the paper-slip method used to select the grid segments?
4. Why do biologists use Sampling? Why can't they just go into the forest and count all the sunflower plants?

