

Name:

Period:



## 5 Populations Practicing Quadrat Sampling

### **Background Information:**

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, a practice called sampling. In this activity you will look at how data obtained by random sampling compare with data obtained by an actual count. Sampling is used to track population growth in an ecosystem. It is one of many methods used by scientists to collect data when studying ecosystems.

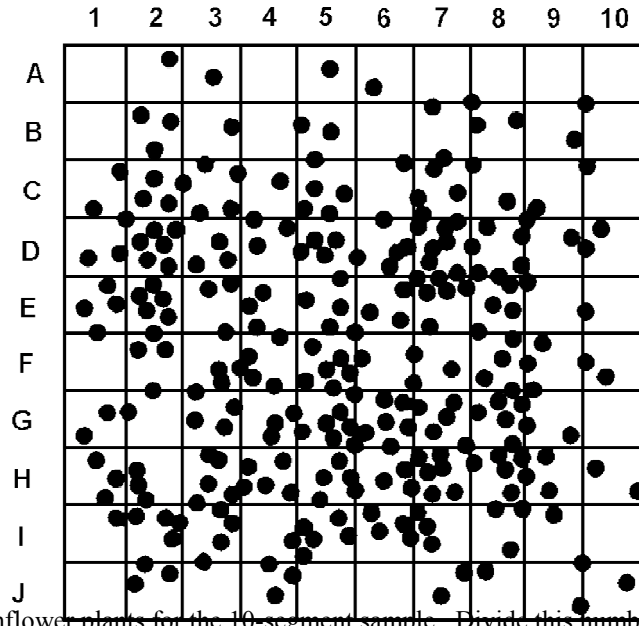
### **Materials Needed (per person)**

No special materials needed.

### **Procedure:**

1. Randomly choose ten squares using the number-letter technique described below.
2. One partner randomly chooses a number between 1 and 10.
3. The other partner randomly chooses a letter between A and J.
4. Both partners write the random number-letter combination in Data Table 1.
5. Repeat until ten random squares have been chosen and recorded. It is okay to use the same number or letter more than once, just be sure that you are choosing numbers and letters randomly.
6. Refer to Figure 1, which is a grid that represents a meadow measuring 10 m on each side. Each grid segment is 1 m x 1 m. Each black circle represents one sunflower plant.
7. Beginning with the first square you randomly chose, count the number of sunflower plants in that square. You are the scientist and will determine what constitutes in or out of each square. Be consistent for every square. Record this number in the appropriate column in Data Table 1.
8. Repeat step 7 until you have data for 10 different grid segments. These 10 grid segments represent a sample. Gathering data from a randomly selected sample of a larger area or group is called sampling.

**Figure 1 - Sunflowers in a 100m<sup>2</sup> plot**



*Data Table 1*

9. Find the total number of sunflower plants for the 10-segment sample. Divide this number by 10 to determine the average number of sunflower plants per square meter in the sample. Record this number in the Data Table. Multiply the average number of sunflower plants per square meter by 100 to find the estimated number of sunflower plants in the meadow.

Number - Letter Combination	Number of Sunflowers Counted
1.	
2.	
3.	
4.	

Record this number in your Data Table.

***Analysis and Conclusions:***

1. Compare the actual count with the data you recorded for your estimated count. Are they similar? Explain using actual

data.

2. Why was the random number-letter method used to select the grid segments for you to count?
3. What is the percentage error in your estimate? To calculate percentage error, use the following formula:

$$\frac{\text{Expected} - \text{Observed}}{\text{Observed}} \times 100 = \text{percent error, in absolute value}$$

The higher the number, the less accurate your data was compared to the actual. Show your work below.

4. How could you change procedures in this activity to reduce your percentage error?