

Have you ever wondered how many blades of grass are found in the yard around your home? Have you ever wondered how much of your “lawn” is weeds rather than grass? In this activity, you will estimate the number of blades of grass found on the school yard near our classroom.

For many years, scientists have tried to determine the number of plants or animals that live in a certain area. For example, plant ecologists might want to know how many trees exist in a tropical rain forest or biologists may wish to know how many bald eagles live in North America. Marine biologists may want to know how much sea grass is growing in Logy Bay.

To answer these kinds of questions, scientists have created an accurate method of estimating a population. This method is called sampling. Sampling involves counting a representative fraction of the population, then making a prediction of the whole population. When using sampling methods to estimate a population, you do not have to count each individual blade of grass, animal, or grain of sand to find the total number.

In this activity, you will collect a sample and estimate the total number of blades of grass and total number of weeds in a given area.

Objectives:

To accurately estimate (1) the number of blades of grass and (2) the number of weeds that exist in a square meter of a school yard through the use of sampling methods. We will also calculate the percentage of the lawn that consists of weeds.

Materials:

1 m² Pex Pipe Quadrat

100cm² Straw Quadrat

Pencil

Clipboard

Procedure:

1. Locate a grassy area in the school yard that is at least one meter square.
2. Place your 1m² Quadrat on the ground
4. Randomly place the 10 cm² quadrat square somewhere within the larger quadrat.
5. Count the number of blades of grass within the 100 cm² area. Record your answer in the data table.
6. Now, count the number of weeds within the 100 cm² area and record that result in the data table.
7. Repeat steps 5 and 6 at another random location within the large quadrat.
8. Repeat steps 5 and 6 at a third location within the large quadrat. Record your data in the table.
9. Add the number of blades of grass in each of the three samples, and then divide by 3. Record your answer in the data table.
10. Add the number of weeds in each of the three samples, and then divide by 3. Record your answer in the data table.
11. You have obtained a representative sample numbers of blades of grass and number of weeds in the 10 cm² square. Now multiply these numbers by 100 to obtain the number of blades of grass and number of weeds in a square meter. Record your answers in the data table.
12. Determine the estimated number of plants in your square meter by adding the estimated total number of blades of grass and the estimated total number of weeds. Record this answer in the space provided.
13. Calculate the percentage of weeds in your square meter quadrat by dividing the estimated total number of weeds by the estimated total number of plants and then multiplying by 100. Record this percentage in the space provided.

Table 1.0 _____ (1 + 4 Marks)

Quadrat 1	Sample 1	Sample 2	Sample 3	Total of 3 Samples	Average	Per m ² (x100)	Total Plants	%
Blades of Grass								
Weeds								

Questions:

- 1. Calculate the number of blades of grass that might exist in a football field. (Assume the field has the same kind of grass as in the school yard, and is roughly 2,000 square meters.) (2 Marks)

- 2. Why do we take three representative samples in estimating the population of something? (1 Mark)

- 3. What is a representative sample? (1 Mark)

- 4. Instead of using a representative sample to determine the size of a population, why not just count the individuals to determine the total number? (2 Mark)

- 5. How do you think that the Department of Department of Fisheries and Land Resources' Wildlife Division determine that there were 5000 moose in Gros Morne National Park in 2011? (2 Mark)

- 6. **CREATE YOUR OWN SAMPLING METHOD** (Explain Mark-recapture)
You have been asked to determine the number of birds in Gros Morne National Park. How might you estimate the total number of birds? List the steps that you will take to calculate the number of birds. Include a description of how you will obtain an accurate sample. (5 Marks)

- 7. **CRITICAL THINKING** Mackerel spawn (lay eggs) over kelp beds along the coast of Newfoundland because they provide protection for their young. How might knowledge of the number and density of kelp beds help fish biologists estimate the future number of Mackerel? (2 Marks)
