



## Tour Theme: Animals (grades 9-12)

### Post-Visit Activity #1: Tagging Lab

#### Objectives:

- Understand the importance of an ecosystem
- Learn how to monitor species populations
- Understand the importance of species monitoring
- Apply mathematics skills to a hands-on science experiment
- Use the scientific method to understand population monitoring

#### Overview:

In order to fully understand the dynamics of an ecosystem, it is necessary to have a good idea of the size of each population in the ecosystem. Because it may be difficult or impossible to count each individual of a population, tagging is a useful method for determining the size of an animal population. At the Springs Preserve, animals from mice to rabbits are captured and tagged.

#### Materials:

Seeds (or beans)  
Two Trays  
Permanent Marker  
Paper  
Pen  
Calculator

#### Procedure Overview:

The first step of this process is to capture and tag a known number of individuals in a population. Once tagging is complete, samples of the population are recaptured and analyzed. After counting the number of tagged individuals and the total number of individuals recaptured, the percentage of individuals tagged is determined for the sample. The recapturing step is repeated several times and the average percentage of tagged individuals is calculated. Finally, the population size is estimated by inferring that the total number of individuals tagged represent approximately the same percentage of the total population as the tagged individuals represent in the average sample.

$$N \frac{\%}{100} = T \quad \text{or:} \quad N = \frac{100T}{\%}$$

where: N = population size  
% = average percentage of tagged individuals  
T = number of individuals tagged

### Procedures:

1. Obtain a population of seeds, two trays, and a marker.
2. Use a marker to tag forty individuals; then, return them to the population.
3. Mix the seeds up well, then without looking into the tray, grab a sample of the population (50-100 individuals).
4. Count and record the number of tagged individuals and the total number of individuals.
5. Calculate the percentage of tagged individuals.
6. Repeat steps four and five a total of ten times.

### Postlab:

1. Calculate the percentage of tagged individuals found in each trial.
2. Calculate the average percentage of tagged individuals.
3. Calculate your estimated population size.
4. Count all of the individuals in the population  
**note:** remove all tagged seeds and dispose of them as you count.
5. Calculate the percent error for your estimate:

$$\% \text{ error} = \frac{|\text{actual \#} - \text{estimated \#}|}{\text{actual \#}} \times 100$$

6. As a group: turn in your data, calculations, and a short conclusion.