

Name \_\_\_\_\_

Date \_\_\_\_\_

### Mark and Recapture Activity Directions

Wildlife managers use a "Mark and Recapture" technique for counting animals. For this method to yield effective results (good population density values), several assumptions need to be considered and controlled.

Assumptions:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

Materials:

1 1000 mL beaker

plastic container

1 500 mL beaker

baking sheet

Black beans

rubber band

White beans

Directions:

1. Without looking, reach into the beaker of black beans and remove a handful of beans. This is considered the "first trapping". Count the # of beans and record on the answer sheet.
2. Exchange the captured black beans 1:1 for the white beans. These are now marked individuals.
3. Place the captured black beans off to the side in the plastic container and put the exchanged white beans back into the large beaker.
4. Cover the beaker with aluminum foil and secure with a rubber band. Shake vigorously so that the beans are dispersed evenly.
5. Without looking, reach into the beaker and remove a handful of beans. Separate them into "marked" (white beans) and "unmarked" (black beans). Record the # of white beans and black beans separately on the data table. Record the total captured.
6. Using the formula below, estimate the population size and record.

$$N = \frac{\text{total captured in first trapping} \times \text{total captured in second trapping}}{\text{Number of marked recaptured}}$$

*total population*

7. Remove the white beans from the 1000 mL beaker and return the black beans in the plastic container back in the 1000 mL beaker.
8. Repeat the mark and recapture technique (2) more times. Record your data.
9. Calculate "N" for each trial and record on the Data Table
10. Calculate the average population size and record on the Data Table
11. Return all the black beans to the 1000 mL beaker and then pour them into the baking sheet. Count the total number black beans to determine the actual population size.
12. On your Data Table, determine the percent error using the formula:

$$\text{Percent Error} = \frac{\text{Actual Population} - \text{Calculated Average (N)}}{\text{Actual Population}} \times 100$$