Agenda

- Calculating Population Sizes
- Random Sampling
- Mark + Recapture

- 3B QUIZ 2 Friday 04/27

May 19-3:55 PM

Random Sampling

Procedure:

1. Randomly remove one slip from each number and letter random sampling 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.

2. Repeat step 1 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.

3. Find the total number of sunflower plants for the 10 segment sample. This is an estimation based on a formula. 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. Multiple the average number of sunflower plants by 100 (this is the total number of grid segments) to find the total number of plants in the meadow based on your sample. Record this number in your data table.

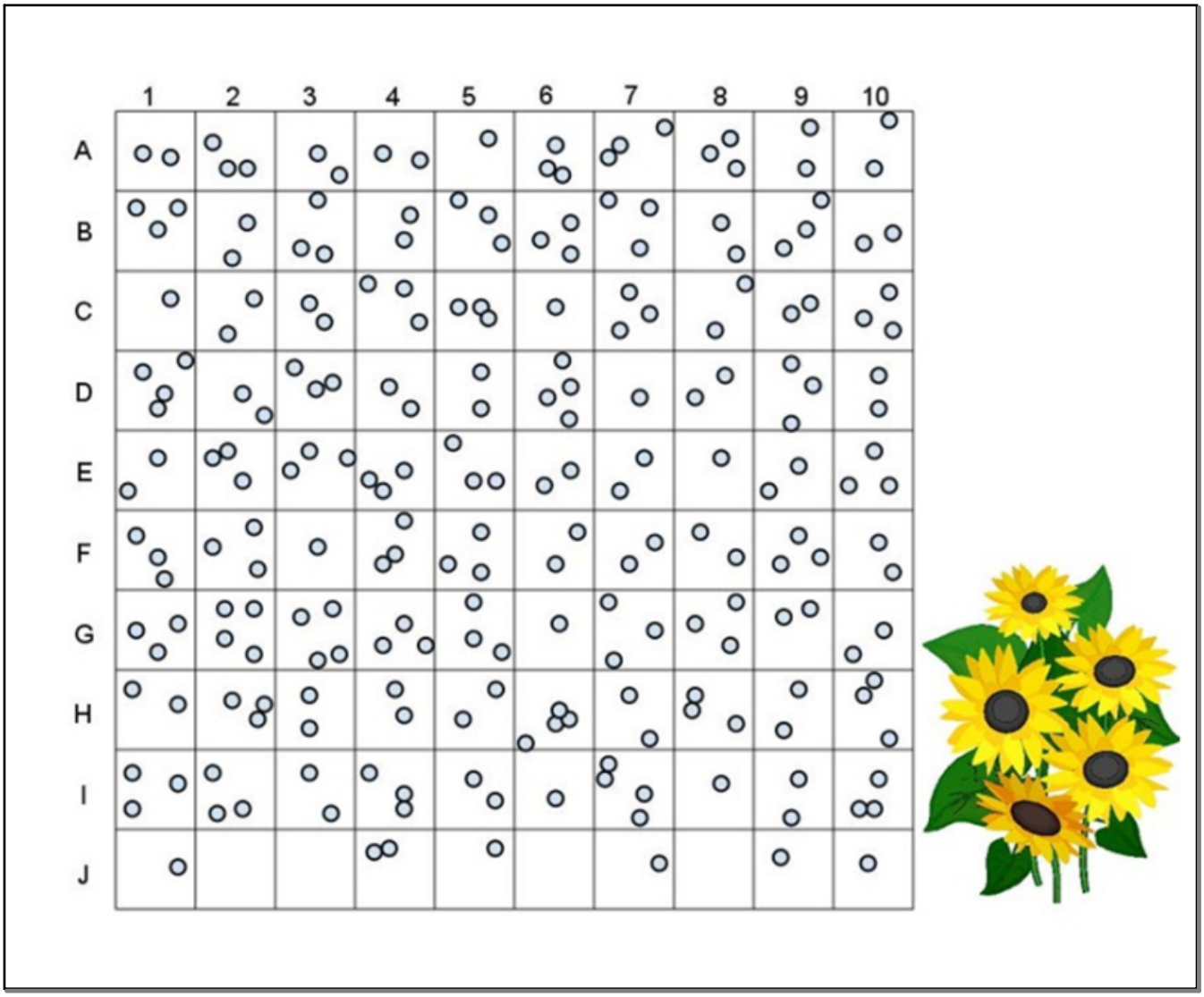
Random Sampling Data	
Grid Segment (number - letter)	**Number of Sunflowers**
C5	
G1	
H7	
B10	
J5	
J4	
F9	
E5	
G9	
G4	
Total # of Sunflowers	
Average (divide total by 10)	
Total # of plants (multiply average by 100)	

Actual Data

Total number of Sunflowers 228 (count by hand)

Average number of Sunflowers (divide total by 10) Per grid 22.3

Apr 23-5:55 PM



Apr 23-6:00 PM

4. Now count all the sunflower plants actually shown in the meadow. Record this number in the data table. Divide this figure by 100 to calculate the average number of sunflower plants per each grid.

228 2.3 ave/plot

Analysis:

1. Compare the total number you got for sunflowers from the SAMPLING to the ACTUAL count. How close are they?

2. Why was the paper-slip method used to select the grid segments?

3a. A lazy ecologist collects data from the same field, but he stops just on the side of the road and just counts the 10 segments near the road. These 10 segments are located at J 1-10. When he submits his report, how many sunflowers will he estimate are in the field?

7/10 = 0.7 ave × 100 = 70

b. Suggest a ~~number~~ reason why his estimation differs from your estimation.

4. Population Sampling is usually more effective when the population has an *even* = Uniform *dispersion* pattern. *Clumped dispersion* patterns are the least effective. Explain why this would be the case.

5. Describe how you would use Sampling to determine the population of dandelions in your yard.

6. In a forest that measures 5 miles by 5 miles, a sample was taken to count the number of silver maple trees in the forest. The number of trees counted in the grid is shown below. The grids where the survey was taken were chosen randomly. Determine how many silver maple trees are in this forest using the random sampling technique. Show your work!

	7			
				3
			5	
11		9		

Apr 23-5:56 PM

Estimating Populations Practice

Random Sampling

Using the random sample graphic, complete the following:

Population	Density $/m^2$	Dispersion Pattern	Reason for Distribution	Random Sample Estimate
D. Green	15 / 72 = 0.2	Clumped	Stay warm	
L. Green		Uniform	territory	
Pink				
Orange				
Red				
Blue				
Gray		Uniform		

#ind/area²

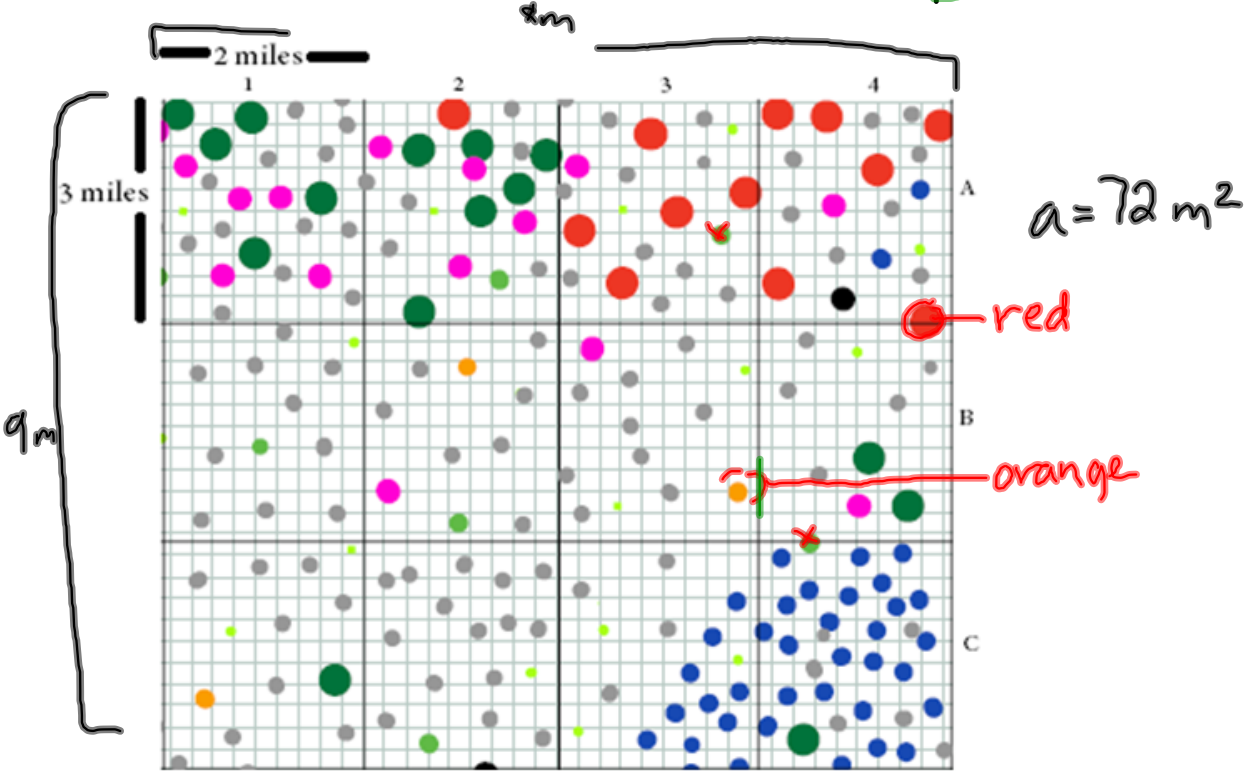
total #

ave/sample plot x 0

pop est

ave x 12 = ___

ave x 12 = ___



Population Estimate Notes

p. 85

Random Sampling

Average # of Individuals / sample plot X # of total plots

Mark & Recapture

$$\text{Population Estimate} = \frac{(\text{Total number captured}) \times (\text{Number marked})}{(\text{Total Number Captured with Mark})}$$

Number Marked 10

Number Captured 37

Number Captured with mark 9

$\frac{37 \times 10}{9}$

Population Estimate = 41

Trial Number	Number Captured	Number Recaptured with mark
1	4	1
2	5	1
3	2	1
4	3	0
5	5	1
6	3	1
7	4	2
8	3	1
9	5	1
10	3	0
Total:	37	9

Apr 24-9:45 AM