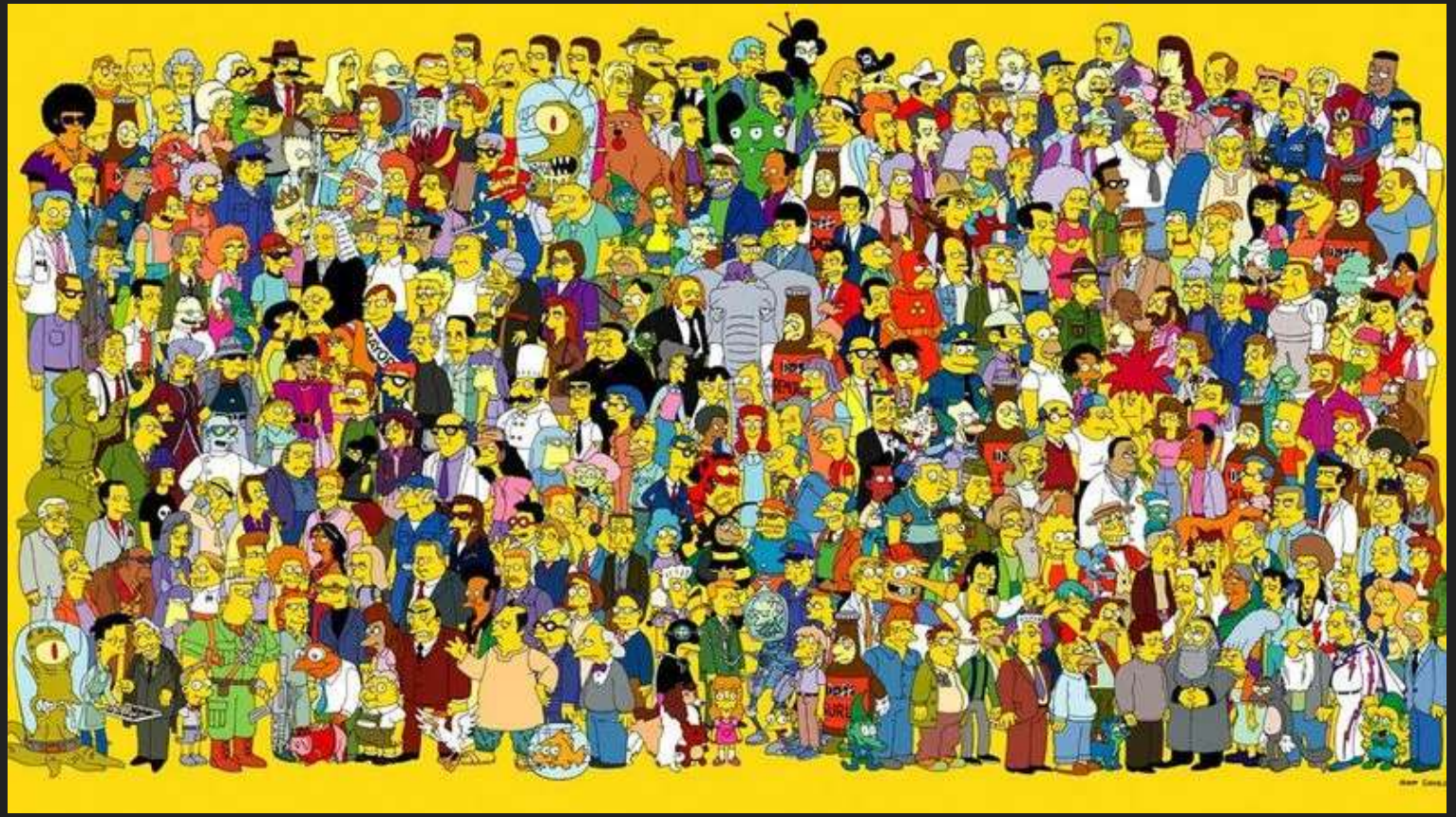
Population Ecology:

Population Estimation & Sampling

December 2019

How many are in each jar or image?

#1: The Simpsons



#2: Pennies

Total Pennies: 224

#3: Beads

Total Beads: 70z

#4: Gumdrops

Total Gumdrops: 82

What are some reasons why scientists might want to count populations?

Sample Count: Count sections of the population and use math to estimate total population.

Total Count: Counting all individuals in a population.

Read Background & Complete Chart - 10 minutes

The Great Elephant Census
Modeling Activity

hhmi | BioInteractive

Student Activity

Procedures and Questions

Follow the instructions and complete the questions as you work through the activity.

1. In the chart below, list all advantages and disadvantages you can think of in using a sample count versus a total count for population estimates.

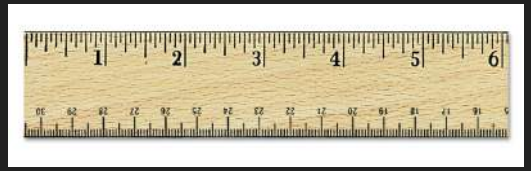
Survey Method	Advantage (+)	Disadvantage (-)
Sample count		

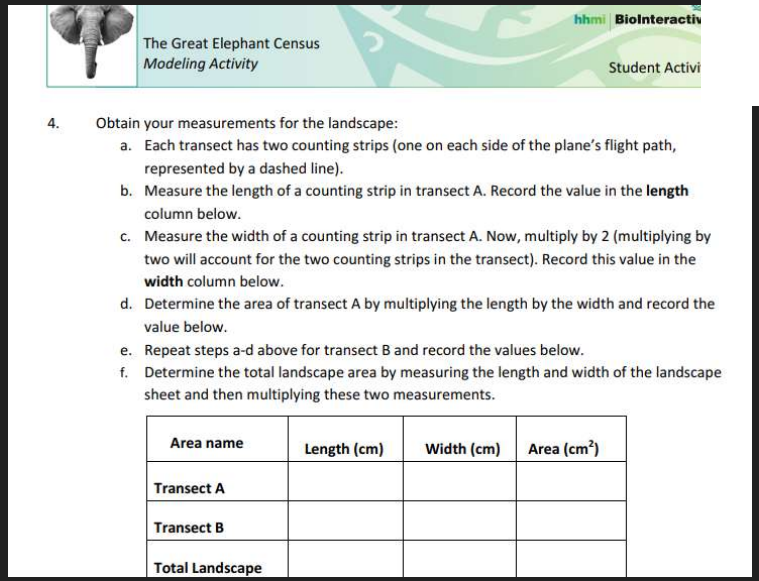
Write your group responses/ideas here. Be prepared to share.

The Great Elephant Census

Materials for the lab:

Counting sheet, worksheet, ruler, split peas (these are our elephants)





The Great Elephant Census
Modeling Activity

Student Activi

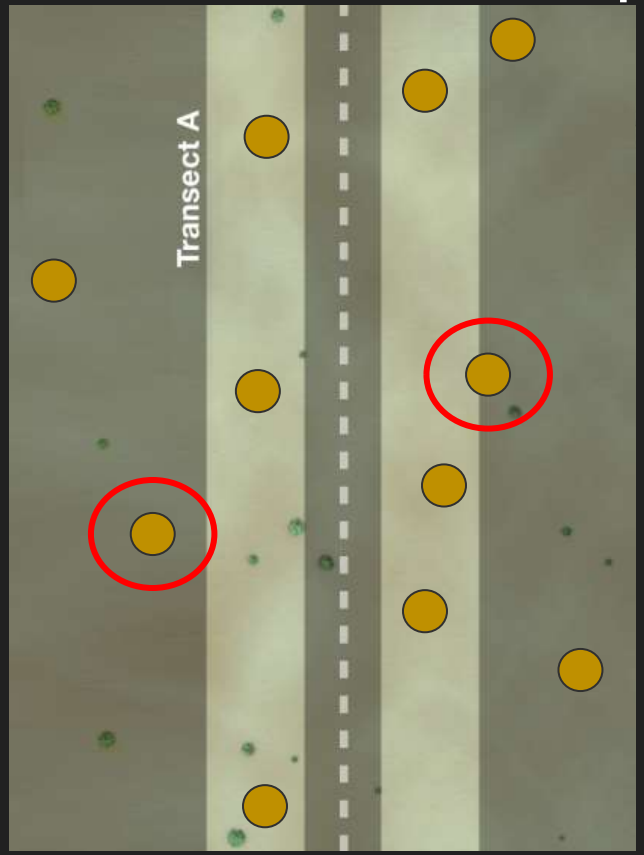
4. Obtain your measurements for the landscape:
   a. Each transect has two counting strips (one on each side of the plane's flight path, represented by a dashed line).
   b. Measure the length of a counting strip in transect A. Record the value in the **length** column below.
   c. Measure the width of a counting strip in transect A. Now, multiply by 2 (multiplying by two will account for the two counting strips in the transect). Record this value in the **width** column below.
   d. Determine the area of transect A by multiplying the length by the width and record the value below.
   e. Repeat steps a-d above for transect B and record the values below.
   f. Determine the total landscape area by measuring the length and width of the landscape sheet and then multiplying these two measurements.

Area name	Length (cm)	Width (cm)	Area (cm^2)
Transect A			
Transect B			
Total Landscape			

4. Obtain your measurements for the landscape:
   a. Each transect has two counting strips (one on each side of the plane's flight path, represented by a dashed line).
   b. Measure the length of a counting strip in transect A. Record the value in the **length** column below.
   c. Measure the width of a counting strip in transect A. Now, multiply by 2 (multiplying by two will account for the two counting strips in the transect). Record this value in the **width** column below.
   d. Determine the area of transect A by multiplying the length by the width and record the value below.
   e. Repeat steps a-d above for transect B and record the values below.
   f. Determine the total landscape area by measuring the length and width of the landscape sheet and then multiplying these two measurements.

Area name	Length (cm)	Width (cm)	Area (cm^2)
Transect A			
Transect B			
Total Landscape			

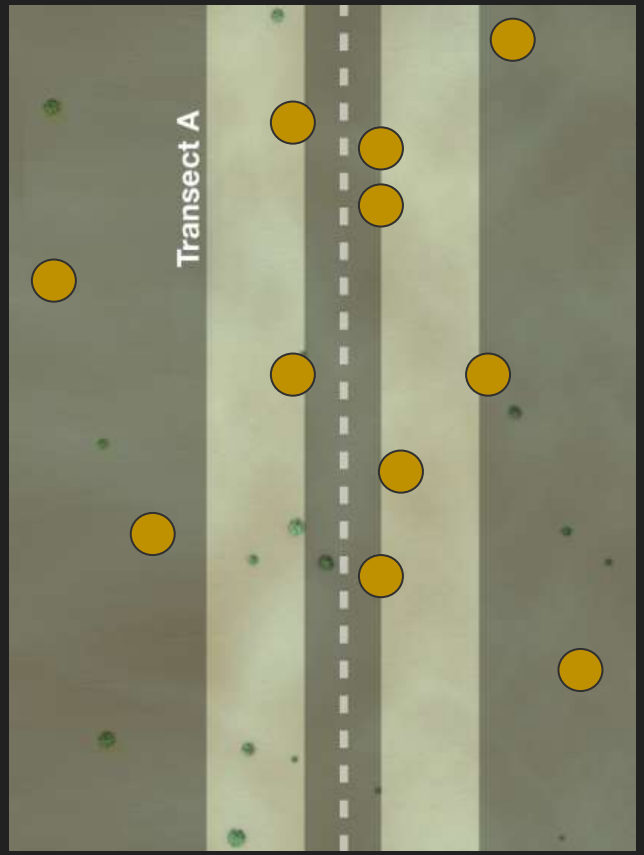
How will we count our elephants?



Would you count or not count the circled elephants? Why?

How many elephants would you count in this transect?

Count your elephants!



Record your data.

Transect	Number of elephants spotted in transect	Elephant density in transect $\frac{\text{number of elephants}}{\text{area of the transect cm}^2}$
A		
B		

Data Table 2: Elephant Densities from Sample Count

10. Calculate the average density for the transects (add densities from above and divide by 2) an record. Average density of elephants for transects: _____

11. Estimate the total number of elephants in the landscape by multiplying the average density b the area of the landscape. Record data: _____

Class Data:

Total area for our class:

	Group Number	Total number of elephants in sample count	Actual number of elephants from total count
Totals			

Data Table 3: Class Data for Elephant Counts