

http://www.classzone.com/cz/books/bio_07/book_home.htm?state=CA

Go to “classzone.com”. Click on High School<California<Go. Then chose the McDougal Littell book with the hatching alligator on it. Under “Labs” chose Virtual Labs, then pick Estimating Population Size).

Follow the steps and answer the questions below.

1. Why do farmers need to be aware of the grasshopper population?

2. Explore the lab to learn what is available for your investigation. List the functions of the following items:
 - a. Paint and Paintbrush:

 - b. Insect Sweep Nets:

 - c. Large Plastic Container with Lid:

3. Click on “Background” and answer the following questions.
 - a. What is a population?

 - b. What method do scientists use to estimate the population size of mobile organisms?

 - c. What is population density?

4. Click “Procedure”. Answer this question from your notebook: Can you tell by looking at the meadow how many grasshoppers live in it? List the difficulties you might encounter if you tried to determine the population of grasshoppers by simply examining the meadow. What are some steps you can take to make a more accurate estimate of (*Hint: you will need to write an answer in the notebook to continue*).

Continue with Procedure Steps

5. Fill in the table below with the number of grasshoppers collected during each capture.

| | First Capture | Second Capture |
|--|---------------|----------------|
| Numbers of Grasshoppers in the First Capture | | --- |
| Total Marked and Unmarked Grasshoppers in Second Capture | --- | |
| Number of Marked Grasshoppers in Second Capture | --- | |

Answer the Lab Notebook Conclusion Questions

6. Conclude. What is the estimated population size of the grasshoppers living in this meadow?
7. Apply. The population density of these grasshoppers is one indicator of whether or not they are considered a pest and are capable of causing damage to crops and plant life. Normally, if these grasshoppers have a population density of 0-3 grasshoppers per square meter, they don't pose a significant threat. Find the population density of these grasshoppers per square meter. If one acre is equal to 4,047 square meters, then on average, how many grasshoppers would be found in one square meter?
8. Evaluate. Based on the population density you determined, explain whether or not the grasshoppers pose a threat to nearby crops.
9. Identify Causes. What are some factors that might cause changes in the population of grasshoppers?
10. Analyze. What are some factors that might affect the accuracy of your estimate?
11. Analyze. What are the advantages and disadvantages of the capture-mark-recapture method?