Population Ecology Lab Exercise Using Mice and Fox in a Meadow Ecosystem

Materials:

One habitat container

100 red beads - these are 'control' and represent times that the mice will escape/gets away; "strikes".

100 yellow beads - these represent the prey species; mice

Data sheet

Graph paper

Colored pencils

Fox - students will be the predators in this lab exercise

Procedure:

- 1. Place 100 control (red beads) in the habitat
- 2. Add 10 mice (vellow or white beads) to the habitat

Generation 1 - Your designated 'fox' will draw 15 beads from the habitat, without looking.

If the fox gets 5 yellow/white/mouse beads, it survives and reproduces. You would start generation 2 with 2 fox- the survivor and its offspring.

If a fox gets 10 mice it survives and has 2 babies (fox total is now 3).

If the fox captures less than 5 mice it dies (and doesn't reproduce either).

<u>Count</u> the number of mice left in the habitat container — each of these survivors *reproduces*. For example, if your fox captures 3 of the ten mice (this fox starves) but the 7 mice left in the container reproduce. You would then start generation 2 with 14 mice.

<u>Always</u> start each generation with a minimum of 10 mice and 1 fox; even if all of your organisms die, assume that new ones will discover your meadow and immigrate.

Never have more than 200 mice or 20 fox. (We have set an arbitrary carrying capacity for this meadow.)

Generation 2 - Place beads in your habitat that represent the next generation of mice and fox; consider that some have reproduced and some have starved.

If you have more than one fox, then each fox captures its 15 beads individually. The first fox takes 15 beads, counts the mice and PUTS THE RED BACK. Then the 2nd fox takes 15 beads, counts the mice and RETURNS THE RED. Eventually the more fox you have the more that will start starving, and the "early fox gets the mouse". Total the mice caught by all your fox, subtract from 100 and double the survivors. This is your prey number for the next generation.

"Its getting harder and harder to find food with all this competition !"

Continue for 20 generations.

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Table of Contents Population Ecology Lab Exercises

- 1. Understanding the eBook Population Ecology Lab Exercises
 - The Rise of Digital Reading Population Ecology Lab Exercises
 - Advantages of eBooks Over Traditional Books
- 2. Identifying Population Ecology Lab Exercises
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
- 3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - $\circ\,$ Features to Look for in an Population Ecology Lab Exercises
 - User-Friendly Interface
- 4. Exploring eBook Recommendations from Population Ecology Lab Exercises
 - Personalized Recommendations
 - Population Ecology Lab Exercises User Reviews and Ratings
 - $\circ\,$ Population Ecology Lab Exercises and Bestseller Lists
- 5. Accessing Population Ecology Lab Exercises Free and Paid eBooks
 - Population Ecology Lab Exercises Public Domain eBooks
 - Population Ecology Lab Exercises eBook Subscription Services

- Population Ecology Lab Exercises Budget-Friendly Options
- 6. Navigating Population Ecology Lab Exercises eBook Formats
 - ∘ ePub, PDF, MOBI, and More
 - Population Ecology Lab Exercises Compatibility with Devices
 - Population Ecology Lab Exercises Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Population Ecology Lab Exercises
 - Highlighting and Note-Taking Population Ecology Lab Exercises
 - Interactive Elements Population Ecology Lab Exercises
- 8. Staying Engaged with Population Ecology Lab Exercises
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Population Ecology Lab Exercises
- 9. Balancing eBooks and Physical Books Population Ecology Lab Exercises
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Population Ecology Lab Exercises
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Population Ecology Lab Exercises
 - Setting Reading Goals Population Ecology Lab Exercises
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Population Ecology Lab Exercises
 - Fact-Checking eBook Content of Population Ecology Lab Exercises
 - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
- 14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

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