



FLINN
SCIENTIFIC, INC.
"Your Safer Source for Science Supplies"

P.O. Box 219 • Batavia, IL 60510
(800) 452-1261 • Fax (866) 452-1436
www.flinnsci.com • E-mail: flinn@flinnsci.com

Catalog No. FB1880

Publication No. 10843

Lynx Eats the Hare

Environmental Science Predator–Prey Activity

Introduction

Perform this card game simulation of the interspecific interaction between a predator population and that of its primary prey. Discover the inextricable link between the two populations in this engaging and surprisingly realistic and involving activity.

Concepts

- Predator
- Prey
- Population growth

Background

An interaction between a species (predator) that feeds upon another species (prey) is called a *predator–prey relationship*. The example used in this game is the relationship between the lynx, a catlike predator found in northern American forests, and the snowshoe hare, a rabbit-like species with large back feet. When snowshoe hares are abundant in a given area, the lynx population in the area will be well fed and the survival rate of their offspring high. As a result, the lynx population grows as well. As the number of lynx increases, a larger number of snowshoe hares will be eaten—resulting in a hare population decrease. As the population of hares decreases, the lynx population begins to decline as well.

The predator–prey relationship is an example of a *density-dependent limiting factor*. A density-dependent limiting factor affects the population density (number of organisms per a given area) when it reaches a certain level. Other examples of density-dependent limiting factors are competition, parasitism, and disease. As a population grows beyond the maximum population size that a particular environment will support (known as the *carrying capacity*) limiting factors act to reduce the population. The size of the population will shrink, then grow again, and so on. The resulting cycle of population changes may be repeated indefinitely.

Activity Overview

The predator–prey relationship and the cycles of lynx and hare populations will be simulated while playing an interactive card game.

Materials

- | | |
|---|-------------------------------|
| Flat surface, at least 15" square | Lynx Eats the Hare Data Table |
| Graph paper or computer graphing software | Lynx tally sheet |
| Hare cards, 51 | Ruler |
| Lynx card | Tape, colored or masking |

Procedure

1. Use tape to mark off a square, 15" on each side, on a tabletop or other flat surface. The square represents the area inhabited by a population of hares.
2. Begin the simulation by populating the habitat with three hare cards—spatially dispersed within the square.
3. Randomly toss the lynx card into the square in an effort to capture as many hares as possible. A hare is considered captured if any portion of the lynx card touches the hare card. In order to survive and reproduce, the lynx must capture at least three hares when tossed. When the hare population is at this stage, lynx survival is virtually impossible. Remove any hares captured and enter the results for the first generation on the Lynx Eats the Hare Data Table.

4. The hare population doubles between generations—multiply “Hares Remaining” by two and enter the resulting number in the “Number of Hares” column for the second generation. For example, if no hares were captured in generation one, there will now be six hares in generation two. Place the required number of hare cards in the square. If no lynx survived the previous generation another moves into the area. Toss the newly recruited lynx—repeating step 2. Remove any captured hares and enter the new tallies on the Lynx Eats the Hare Data Table.
5. By generation 5 or 6 the lynx should be able to capture three hares when tossed. If successful, the lynx survives until the next generation and also produces offspring—(one offspring per three hares captured.) Toss the lynx card once for each lynx.
6. As the population builds it is important to separately tally each lynx’s kills, removing captured hares after each time the card is tossed. Determine lynx survival and reproduction using individual lynx capture numbers. Remember, each lynx can only produce an offspring if three hares are captured. Once the total number of lynx is four or more, the individual lynx capture numbers should be tallied on the Lynx Tally Sheet and the totals entered on the Lynx Eats the Hare Data Table.
7. Between generations 9 and 11, the populations will probably crash back to, or near, zero. If and when this happens be sure to begin subsequent generations with at least three hares. Carry the simulation through 20 generations, by which time the cycle will be well on its way to repeating and the next few generations can be more accurately predicted.
8. After 20 generations have been completed, use computer graphing software or graph paper to graph the population changes of both the lynx (Column 2) and the hare (Column 3) versus the generation number (Column 1).
9. Answer the *Post-Lab Questions*.

Post-Lab Questions

1. Based on the results, describe the relationship between the hare and lynx populations.
2. What would happen to the hare population if the lynx became extinct?
3. What would happen to the lynx population if the hare became extinct?
4. List at least three other factors that may influence the lynx and hare populations.
5. What would most likely happen to the vegetation in a given area during times of low hare populations?

Generation	Number of Lynx	Number of Hares	Hares Eaten (Total)	Hares Remaining	Lynx Starved	Lynx Surviving	Lynx Offspring
1	1	3					
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

