Name: _____
Date: _____

The Predator-Prey Simulation

(modified from www.accessexcellence.org/AE/AEPC/WWC/1991/predator.php)

Objectives:

You will model the relationship between a predator population of lynx and a prey population of rabbits in a meadow.

After collecting the data, you will graph the data and then extend the graph to predict the populations of predators and prey for several more generations.

Materials:

* one 7.5-cm cardboard square (the lynx)
* about 250 2.5-cm construction paper squares (the rabbits)
* masking tape (to mark off the meadow, which is about the size of a desk or 61cm wide.)

Procedure:

1. Put 3 rabbits in the meadow in random locations.
2. A lynx arrives at the meadow to go hunting. Throw the lynx square onto the meadow once. If the lynx lands on top of a rabbit square, it eats the rabbit. (At this point in the activity there is no way that the lynx can catch the 3 rabbits that it needs to survive and reproduce. The lynx is not allowed to slide and the rabbits should be spread out in the field.)
3. Complete the data table for generation #1. Number of Rabbits: 3; Number of Lynx: 1; Rabbits Caught: 0; Lynx Starved: 1; Lynx Surviving: 0; New Baby Lynx: 0; Rabbits Left: 3. The lynx will starve and there will be no surviving lynx and no new baby lynx.
4. At the beginning of generation #2, the students must add 3 more squares to the meadow, thereby doubling the number of rabbits left at the end of generation #1. A new lynx immigrates into the meadow. Be sure to spread the rabbits out in the meadow. The students throw the lynx card. Continue with generation #3, and so on.
5. Eventually the rabbit population increases to a level that allows the lynx to catch 3 rabbits in a single toss. If the lynx catches 3 rabbits it not only survives but it reproduces too! It has one baby lynx for each 3 rabbits that it catches. Therefore, if it catches 6 rabbits it will have 2 babies. Lynx are not allowed to cheat, but they should try to be efficient.
6. As the number of lynx increases throw the cardboard square once for each lynx. Record the number of rabbits caught by each lynx.

Name: _____
Date: _____

7. There are always at least 3 rabbits at the beginning of a generation. If and when the entire rabbit population is wiped out, then new rabbits immigrate into the meadow and the simulation can continue with 3 new rabbits.

8. Remember that the number of rabbits in the meadow needs to be correct at all times. Remove the rabbits caught and add new ones as indicated by your data table.

9. Model about sixteen generations and predict nine more (up to a total of 25 generations). Base the prediction on the pattern observed during the first sixteen generations.

Analysis:

Graph the data for 25 generations. Place both the rabbit and the lynx data (the first two columns of the data table) on the same graph so that the interrelationship can be easily observed. Label the y-axis "Number of Animals" and the x-axis "Generations." Use one kind or color of line for rabbits and another for lynx.

Generation	Rabbits	Lynx	Rabbits Caught	Lynx Starved	Lynx Surviving	New Baby Lynx	Rabbits Left
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							

Name: _____
Date: _____

14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Questions:

1-) What is happening to the number of rabbits in the first 3 generations?

2-) In what generation does the number of lynx increase?

3-) In this simulation, what made the number of lynx increase?

Name: _____
Date: _____

4-) In real life, what other factors could help the number of lynx increase? (make at least 2 suggestions)

5-) In real life, what other factors could help to decrease the number of rabbits? (make at least 2 suggestions)