Name:_____

Lab: Predator/Prey Interaction MAKEUP ASSIGNMENT

(modified from Addison-Wesley Publishing)

Background: Organisms interact in many different ways. Some of the interactions have to do with feeding patterns. These feeding relationships make up what are called food chains. Predators depend on the population of prey organisms. Correspondingly, the number of prey organisms is limited by the number of predators that feed on them. In other words, the size of predator and prey populations are dependent on each other. This relationship depends on the specific kinds of organisms and the conditions in which they live. In this investigation, you will model interactions between a population of owls and their prey, a population of mice.

What We Did in Class:
Students simulated an ecosystem where owls preyed on mice by dropping cardboard "owls" onto paper "mice" within a 30 cm by 30 cm habitat on their desk. Two rules governed the growth of each population:

(1) *There was no limit on the number of additional mice added per generation, though the total mouse population could not exceed 200 at any time.*

(2) Owls could not exceed three additional owls per generation, though there was no limit on the total number of owls at any time.

Students kept track of owl and mouse population size over several generations, then graphed the data to assist in analyzing trends. You will use a set of class data to do the same.

Procedure: Create a double-line graph using the data below. Use two y-axes (number of owls & number of mice) with generations on the x-axis. Be sure to use graph paper.

Prelab Questions:
1. Create a hypothesis for this lab. Be sure to use the words "if" and "then".

2. What factors might be limiting the mouse population to no more than 200 individuals?

3. What factors might be limiting the owl population to no more than three additional owls per generation?

4. Which of the two species is a K-selected species? How does this influence their population?

5. Which of the two species is an r-selected species? How does this influence their population?

Data:

A	B	C	D	E	F	G
Generation	**# of Mice at start of generation**	**# of Owls at start of generation**	**# of Mice caught**	**# of Owls starved**	**# of surviving Mice**	**# of surviving Owls**
1	**100**	**4**	15	0	85	4
2	170	7	30	0	140	7
3	200	10	32	1	168	9
4	200	12	103	0	97	12
5	194	15	134	2	60	13
6	120	16	66	6	54	10
7	108	13	64	5	44	8
8	88	11	29	2	59	9
9	118	12	52	2	66	10
10	122	13	40	1	82	13

Analysis Questions:

6. What happened to the mouse population during the first few generations? What happened to the owl population?

7. What happened to the mouse population towards the end of the simulation? What happened to the owl population?

8. Based on your graph, relate the trends in population sizes of mice and owls.

9. Was your hypothesis correct? Support this answer with data.

10. Suppose you were given an unlabeled graph of owl and mouse populations. Given what you have observed, how could you infer which curve represented the owls and which curve represented the mice?

11. Compare your model of interactions between the owl and mouse populations with what might actually occur in a community that includes owls and mice. What would be the major differences?

12. What have you learned from this makeup lab?