Oh Deer!

An investigation into *limiting factors*

PROBLEM:

How do limiting factors affect a population of deer?

RESEARCH:

In the natural world, limiting factors like the availability of food, water, shelter and space can change animal and plant populations. Other limiting factors like competition for resources, predation and disease can also impact populations. If any of the limiting factors change, animal and plant populations change, too. Some changes may cause a population to increase. If there are more plants than usual in an area, populations of animals that eat that plant may increase. If one animal's population increases, the population of animals that eats that animal might also increase. Increases in population aren't always good. Sometimes a population will grow too large for the environment to support. Other changes in limiting factors will cause a population to decrease. If a population becomes diseased, the population may decrease and the population of animals that eat the diseased animals will also decrease. In nature, populations usually balance themselves. Sometimes when man impacts populations, they can't always reestablish a natural balance. Humans can impact animal and plant populations. When humans develop land for houses and buildings, they cut down trees and change animal and plant habitats. Some animals like the raccoon and the skunk can adapt, but other animals can't adapt and their populations are affected. The common loon nests on land near large lakes. Some loon nesting places have been taken over by human development and the loon population has decreased. Pollution can also hurt animal and plant populations. Sometimes hunting can impact animal populations. Whale populations have been lowered because of over-hunting. Predator/prey relationships play a big role in animal populations. If the balance between predator and prey is changed, populations are changed. The white-tailed deer population in some areas has grown too large because there are no natural predators. Mountain lions and wolves are the natural predators of the white-tailed deer. Wolf and mountain lion populations have been lowered due to over-hunting and habitat loss. This loss of a natural predator for the white-tailed deer, along with other factors, has led to overpopulation of the white-tailed deer in some areas.

ORGANIZATION:

Class of 30 = 21 limiting factors
7 deer
2 cougars

Signs= Habitat-"hooves" over head in triangle
Food-"hooves" over stomach
Water-"hooves" over mouth

OUTSIDE:

- All limiting factors line up on the EAST side of the field facing the tennis courts....spread out from sidewalk to sidewalk
- All deer line up on the WEST side of the field by the rocks facing the I-building
- All cougars stand on the north sidewalk facing Chandler Heights Rd.

1. All of the deer make the correct sign for one of the limiting factors.
2. All of the limiting factors make the correct sign for one of the factors.
3. When the teacher says, "Oh Deer!" students will turn around to face each other.
4. Deer continue to show the sign and walk to the same limiting factor as the sign you made. DO NOT switch your sign!
    a. Once deer find their sign (factor), link arms and both walk back to the deer line.
    b. If deer do not find their sign, they become part of the limiting factors.
5. All students turn back-to-back.
6. Have student or teacher tallying the number of deer.
7. Repeat steps 1-6 for 3 rounds.
8. After 3 rounds, when the teacher says, "Oh Deer!" the cougar will be released.
    a. Cougars must skip while hunting deer.
    b. Cougars can only catch deer that are heading towards the limiting factors.
    c. If a cougar catches a deer, both return to the cougar area.
    d. If a cougar does not catch a deer, the cougar becomes part of the limiting factors.
9. Now after every round, tally the deer and cougar populations.
10. Repeat steps 1-5 and 8-9 for 15 rounds.

Oh Deer!

An investigation into *limiting factors*

STUDENT WORKSHEET

Name: _____ **Date:** _____

Problem: (Record the question you are trying to answer)

From page 1

Research: (Record notes from the research information that you feel is important to trying to answer the problem!)

Hypothesis: (Based on your research, record your hypothesis in the correct format)

If limiting factors (state something), then the population will (prediction) because (research).

Materials: (Record the materials used)

- Students
- Teacher
- Packets
- Field

Summary of Procedures: (In a brief paragraph, summarize what you did for this activity)

- Captured limiting factors became deer.
- Captured deer became cougars.
- Deer and cougars who did not get their needs met became limiting factors.

Oh Deer!

An investigation into *limiting factors*

Data:

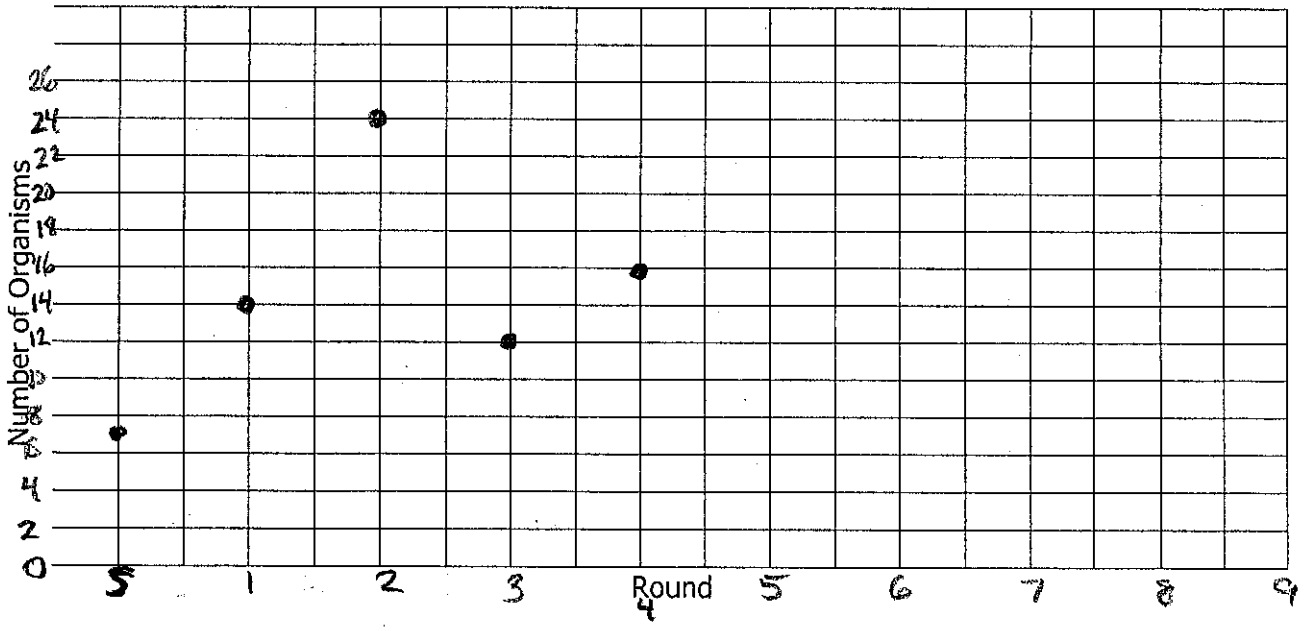
Record the number of deer and cougar after each year (round).

Year (round)	Number of Deer	Number of Cougar
START	7	
1	14	
2	24	
3	10	
4	12	4
5	11	8
6	8	15
7	5	21
8	0	13
9	0	0
10		
11		
12		

← 2

Graph:

Create a graph to represent the data collected from the game. Line graph



Results: (Write a short paragraph summarizing what the data proves to you)

Oh Deer!

An investigation into *limiting factors*

Conclusions:

(Write a good – ideas, conventions, word choice - conclusion paragraph following the format in your flipchart. When you are done, answer the questions on the back of this sheet)

Oh Deer!

An investigation into *limiting factors*

1. Explain how starting with more limiting factors than deer models "real life".

2. Hypothesize about why the deer become part of the limiting factors when they do not find a match.

3. Justify why the limiting factor became a part of the deer population when the deer found the limiting factor he/she needed.

4. Develop an explanation as to why the deer became part of the cougar population after they were caught?

5. Describe any trend or pattern you see in the graph. Predict if this trend would be true in all predator-prey situations.

6. Propose the number of deer and cougar that seems to be the carrying capacity of this habitat. Convince me that you are correct!

7. Examine the data. Analyze whether the predators were controlling the prey, or the prey were controlling the predators. Explain how your response makes sense!