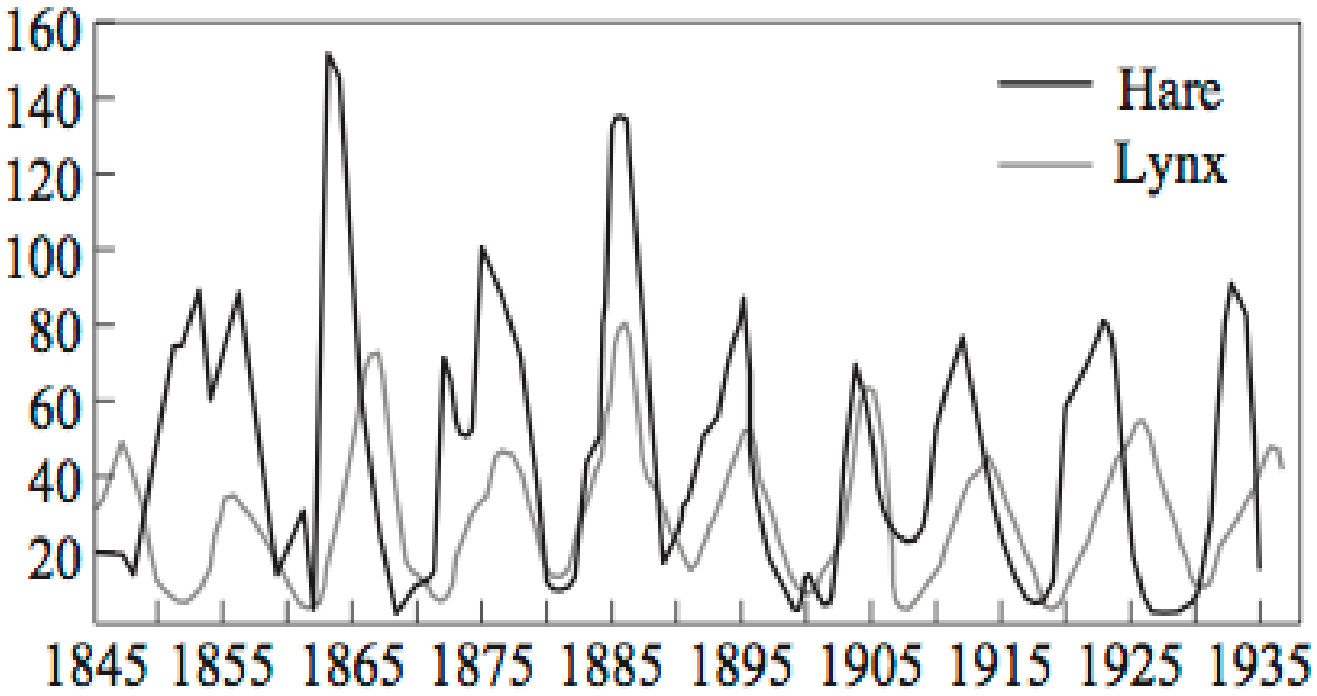
Lab: Predator – Prey Relationships: The Study of the Snowshoe Hare and the Lynx

Background: The snowshoe hare is a common species of rabbit found in North America, most commonly located throughout Canada, Alaska and the northern United States. The snowshoe hare exibits two distinctive coloration patterns depending on the time of year, In the summer, the hare is brown in color and in the winter, white, to camouflage itself with the snow. These animals are herbivores, feeding on grasses, berries, twigs, bark and leaves.

The Canada lynx is a wild cat that resembles a large house cat with a short tail and prominent tufts on its ears. They are secretive cats, and are rarely seen, even by experienced hunters, in the wild. A carnivorous cat, its habitat overlaps with that of the snowshoe hare.. Lynx will eat grouse, ptarmigan, mice, voles, red squirrels, and carrion. Yet when hares are plentiful, they eat almost nothing else.

For over 300 years, the Hudson Bay Company has been involved in the fur trade in Canada. Detailed company records list the number of snowshoe hare and lynx pelts collected by hunters and trappers every year since the late 1700s. The data they collected demonstrates a cyclical pattern of population changes between the showshoe hare and lynx populations. Use the actual data collected by the Hudson Bay Company, this data is illustrated in the graph below:.



Procedure:

1. Working with your partner, examine the graph carefully.
2. One of you will enter the population of the lynx for each year indicated on the chart on the next page, while the other records the population of the snowshoe hare for the same years. Remember that the y axis indicated number of animals in the **THOUSANDS.**
3. Indicate next to each recorded population number whether this number is higher or lower with respect to the previous five years. For example,

YEAR	HARE	LYNX
1865	80,000 ↓	60,000 ↑

4. Exchange data with your partner and then calculate the total population for each animal.
5. Calculate the average population over a 90 year period for each animal.
6. Using a different color for each species, draw two horizontal lines on the graph, one representing the average population for the hare and one representing the average population for the lynx.. **Don't forget to make a key to identify color of line with the appropriate animal.**

Graph Analysis:

1. Which species has the overall larger population?
2. How many peaks are there **ABOVE** the average line for the hare?
3. How many peaks are there **ABOVE** The average line for the lynx?
4. Do the peaks occur at the SAME time for the hare and the lynx? **Explain your answer.**
5. Between 1885 and 1890, what happended to the hare population?
6. Why does the hare popuation start to increase a few years before the lynx population?
7. When the lynx population is at its maxiumum, what is happening to the hare population? **Explain your answer.**
8. What keeps the number of lynxes controlled?
9. What heeps the number of hares controlled?
10. Describe what would happen to the hares if the lynxes were elminated from their environment.
11. Describe what would happen to the lynxes if the hares were eliminated from their environment.

Conclusions:

1. In the wild in Africa, zebras and lions live together.. In this environment lions are the predators of zebra. For the following four situations, explain the short term and long term changes that will occur to the zebra and lion populations.

    a. the zebra population increases
    b. the lion population increases
    c. the zebras contracted a virus that killed 75% of the their population
    d. the lions contracted a parasitic infection that killed 75% of their population

2. Discuss three examples that illustrate your dependency on other people in the school and explain how that contributes to the stability of the school environment.
3. Give a "real life" example that demonstrates how three different populations in an ecosystem of dependent on each other and, as a result, their numbers are stay relatively stable in the long term.
4. Using the example from #3, predict how the elimination of one population may affect the remaining populations.

Observations Chart:

YEAR	HARE POPULATION	LYNX POPULATION
1845	20,000	30,000
1850		
1855		
1860		
1865		
1870		
1875		
1880		
1885		
1890		
1895		
1900		
1905		
1910		
1915		
1920		
1925		
1930		
1935		
TOTAL POPULATION:		
AVERAGE POPULATION FOR 90 YEARS (divide by 19)		

Average Hare Population for 90 Years (rounded #) _____

Average Lynx Population (rounded #) _____