Polar Animals
9-12 Classroom Activity

Lemming Lowdown

OBJECTIVE

Students will graph hypthetical population levels and predict the effect of lemming population fluctuartins on predator species.

ACTION

1. Read BACKGROUND below, discuss food chains, food webs, and predator-prey relationships.

2. Copy and distribute Lemming Lowdown funsheet to individuals or student groups.

3. Have students plot data points on the graph provided.

4. Using these data points as a base, have students estimate the next four-year population cycle assuming that environmental conditions remain stable.

5. Have students estimate the population variations of predators that feed on lemmings, such as snowy owls, ermine, and arctic foxes.

6. For results on a survey conducted in western Arctic in 1995/96 go to http://www.yukoncollege.yk.ca/programs/nri/gilbert95.htm#results

BACKGROUND INFORMATION

Arctic animal populations living on the tundra often follow multiyear cycles of repeated explosions and crashes in the numbers of individuals. Changes in the rates of reproduction and mortality cause these dramatic fluctuations. This is especially true of animals that rely on one major food source. Lemmings—small, furry rodents that live underground and eat plant matter—follow such a cycle.

When food sources are plentiful, lemmings reproduce quickly. A female lemming can give birth to up to eight babies every five weeks. As the population grows, food becomes scarce and living spaces become crowded. Eventually, lemmings leave the area they are in and move to find a new one. Often thousands of lemmings migrate at the same time. For more information on lemmings go to http://www.cws-scf.ec.gc.ca/hww-fap/lemming/lemming.html
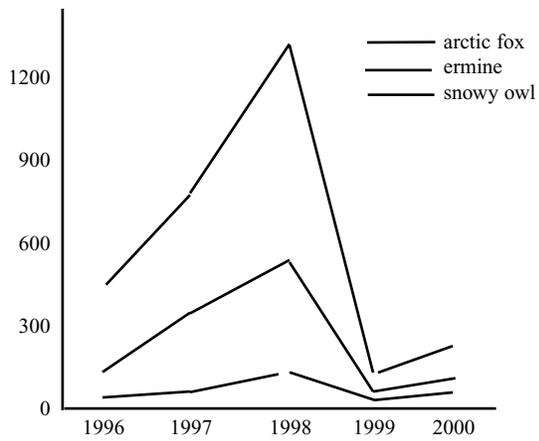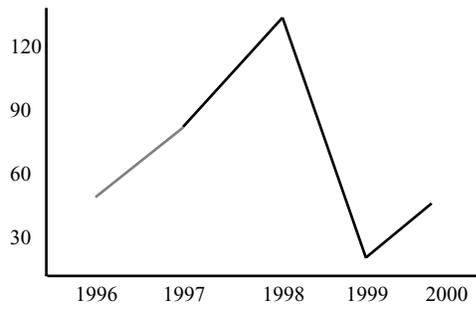
Lemming Lowdown

As a field biologist you have been studying lemmings along the tundra regions of Scandinavia and northwest Russia. You have spent the past five years with a small population that usually lives in a 100-acre area. Using various tagging techniques, you have been able to estimate the populations for the following past years. Here is your data:

year	estimated numbers
1996	50,000
1997	85,000
1998	134,000
1999	20,000

To continue your studies, you need to write a report predicting future population numbers through 2003. You also need to predict population numbers for animals that eat lemmings: the snowy owl, the ermine, and the arctic fox. About 1,000 lemmings will support four breeding pairs of snowy owls, 10 breeding pairs of ermine, and one breeding pair of arctic foxes. Use the chart below to fill in your graph. Add lines for snowy owls, ermine, and arctic foxes.

Number of animals
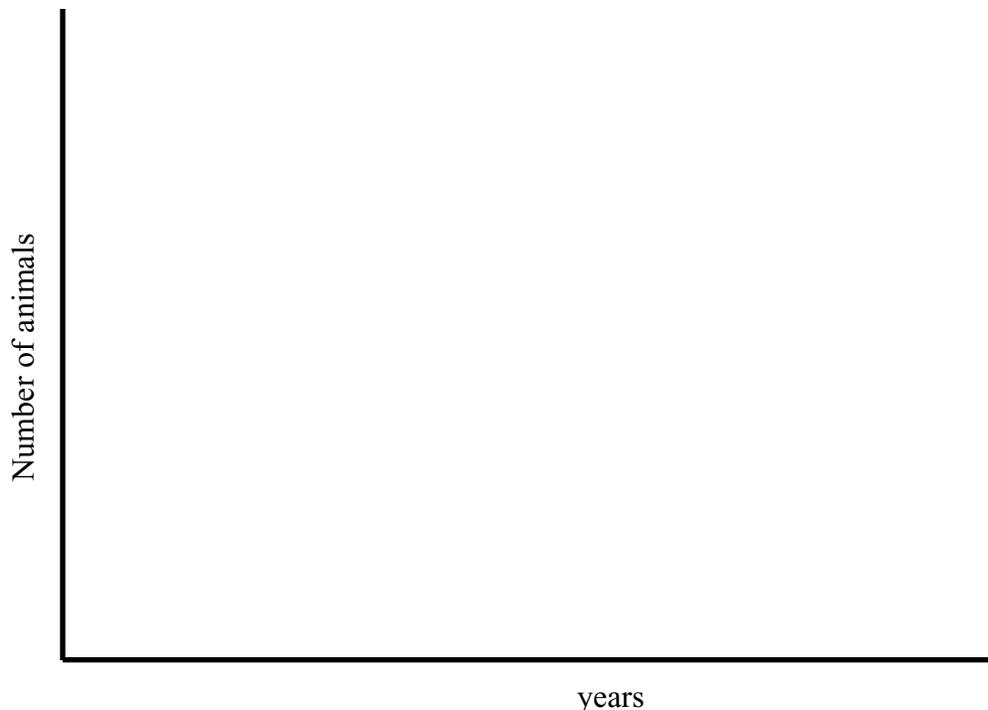
years

MATERIALS

. copies of Lemming Lowdown funsheet
. pencils
. internet access (optional)