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Snowshoe hare and canadian lynx worksheet answers answer keys pdf

The purpose of the discussion is not to decide on the true reason that the cycle exists but to encourage students to come up with a logical theory based on the evidence and what they know about ecology. Story 4 of the curriculum deals with kelp forest monitoring and has students graph information about the population density of sea urchins and of kelp plants. Detailed company records list the number of snowshoe hare pelts and the number of lynx pelts collected by hunters and trappers every year since the late 1700's. They discover a relationship between kelp and sea urchins as well as El Nino events. Boutin and A. _____ 3. Why? How would you expect the increasing Lynx population to affect the Snowshoe Hare population? The Population Resource Bureau has a list of lesson plans for teachers related to global population statistics. Why do you think that the numbers of hares are increasing at this time? The Going Further section is more extensive than for other lesson plans on this site and refers teachers to many excellent population change activities that can be found in other curriculum guides.One student's hare & lynx population graphObjectives Can define population. Another theory is that the lynx population determines the hare population. Unfortunately, I was never able to figure out how to order a copy of the program. Discuss their appearance, life cycle, range, habitat and diet. Begin a discussion with the students about why they think these patterns exist. _____ 2. Boonstra, S. Provide another example of population change data and have students, individually or in groups, graph the information, interpret the data, and create a theory. Once the students have created a logical theory, you may want to consider asking them to think of experiments that could test their theory. Introduce the snowshoe hare and the Canada lynx to the students. They also affect one another on the level of populations. Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment. The Canada lynx is a wild cat that resembles a large house cat with a short tail and prominent tufts on its ears. Populations are always changing. Although written for grades 9-12, this lesson plan by the Sierra Club on California's sequoia forests gets into really interesting issues of population control and forest management. Notice how the hare population begins to decrease after the peak. As the number of hares increases, so does the numbers of lynx that survive to eat them. Native Americans observed this cycle long before Europeans began trapping the hares and lynx for their pelts. For example, if they believe the hares are overeating the available vegetation, then a good experiment might be to monitor the population of the hares' favorite foods over a number of years. Examine the graph and answer the questions.1. What happens to the Lynx population when the Snowshoe Hare population goes up? _____The increase in the Hare population would cause the Lynx population to go up too because there _____ is more food for the Lynx (Lynx eat Hares). An intuitive understanding of predator-prey relationships. For example, see the Coho Salmon Graphing worksheet (downloadable below). Information from at Hinterland's Who's Who website about the hare and lynx. It is very secretive and even experienced hunters rarely see one in the wild. Both are outdoor games that illustrate the idea of population change, limiting factors, carrying capacity and can be used to graph population changes over time. Their population falls both as a result of the lowered reproductive success and the sheer number of lynx that are out to eat them. Attachment Size Bioscience 2001.pdf 799.11 KB Lesson Plan Introduce today's activity to the students. A similar game was developed to look at wolf populations by a group of teachers through the Columbia Education Center's Summer Workshop. Can interpret graphs and identify causes of population change. In fact, the size of the prey population has a strong affect on the size of the predator population and vice-versa. Ask the students to describe some of the patterns in the graphs. Its diet consists of grasses, berries, twigs, bark and leaves. A key to many of these studies to the investigation of how populations change over time. 2001. Help students summarize their theory by adding arrows and labels to the graph to explain what is happening according to the theory at different times. These theories include: During peak years, the hares devour all the available vegetation and quite literally breed like rabbits until the environment can no longer support their blossoming population. Please add a comment if you are able to get a copy! Other resources about the hare-lynx population cycle include: An article from the National Wildlife Association discussing the effect of global warming on the hare and lynx. Explain. _____The increase in Lynx population would cause a decrease in the Hare population because there _____ are more Lynx eating more Hares. BioScience 51:25-35), available below as a pdf document. The population does not reestablish itself immediately because it takes time for the vegetation to grow back. The Overview section has detailed information about the hare, lynx, population cycles and even about predator biologists. Do you think that this pattern is still happening today? A great layperson's discussion of the debate can be found in a recent edition of Scientific American, September 2005. Why is the lynx population declining? The United Nations recently developed a set of 8 Millenium Goals that were set by UN leaders to combat extreme poverty. There are many reasons for population change - limited resources, predator-prey cycles, human impact, habitat change - to name but a few. Sometimes changes are the result of humans interfering with food webs or habitats. E. Thank you for your participation! Predator / Prey Relationships Name _____7th Grade Environmental ScienceMrs. Can see how available resources determine the number and type of organisms that environment can support.Vocabulary Predator Prey Population change Time 45-55 minutes Grouping Individual Materials Copy of the Hare Lynx Questions and blank Hare Lynx Graph for each student. Krempa Date & Section _____What goes up must come down! Predators and their prey do not simply interact with one another on an individual basis. Soon, there are too many lynx for the number of hares and the lynx eat away their favorite food until they too suffer a population decline until the hare population can start growing again. Assessment Have students summarize the theory they came up with in their own words. Allow the discussion to be open ended so long as their explanations make logical sense. One distinctive quality is its 2 different coloration patterns - brown in the summer, and white in the winter to better camouflage with the snow. Make overhead for the teacher. J., R. This activity provides students a chance to look at real data and make some hypotheses about what causes population change in the real world. But even when humans do not interfere, populations will still naturally shift up and down or fluctuate. Attachment Size Coho Salmon Graphing.doc 238 KB Sources Of the relationship between the hare and the lynx, by far the most dynamic and engaging is CBC Television's production of Walking with Ghosts. In this activity, students learn to graph population data and then use their graphs to evaluate one of the most famous examples of population change, the predator-prey population cycle of the snowshoe hare and the Canada lynx. For over 300 years, the Hudson Bay Company has been involved in the fur trade in Canada. Some examples of questions you may wish to ask include: Notice how the hare population begins to increase over time until it reaches a peak. In general, are there more lynx or more hares? The snowshoe hare is a common species of rabbit found in North America, its range extending throughout Canada, Alaska, and into the northern United States. The Project WILD K-12 Curriculum and Activity Guide has several great population change activities. The following graph shows how the size of the Lynx and Snowshoe Hare populations in Canada changed over time. R. As the hares become weakened by starvation, the lynx are better able to find and kill them, adding to their decline. Its range overlaps with the snowshoe hare, on which it almost exclusively preys upon. The data is based on the number of animal skins bought from trappers. Look at the lynx population in 1904 to 1906. Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition. Can graph changes in a population over time. _____Less Hares means less food for the lynx to eat so some of the Lynx will die or move out. _____Once students understand the concept of populations, it is important to introduce the idea of population change. Show them pictures. Summary Once students understand the concept of populations, it is important to introduce the idea of population change. Collect background information about the snowshoe hare and Canada lynx from field guides or other information (see Sources). Student Prerequisites A clear understanding of food webs (see the Food Web activity). This handout is designed so that you can give students just the data and blank graph and discuss the interpretation as a whole class OR you can give students a handout with questions that will lead them towards one of several theories. Experience with graphing data on an x-y coordinate system. The data shows a 200 year history of cyclical population booms and busts in the snowshoe hare population and a slightly delayed population boom and bust in the lynx population. Overhead copy of the blank Hare Lynx Graph to chart along with the students OR overhead copy of the completed Hare Lynx Graph. Remind them of the definition of a population and discuss how we will be looking at how populations change over time. Sinclair. The data is taken from the 300 years worth of real data collected by trappers of the Hudson Bay Company. What drives the 10-year cycle of snowshoe hares? What happens to the Lynx population when the Snowshoe Hare population goes down? Field guides or other pictures and background information about snowshoe hares and the Canada lynx Setting classroom Teacher Background After learning about habitats, food webs and food chains, students can begin to discover the relationships between organisms and their environment. My favorites are the "How many bears can live in this forest?" and the "Oh deer!" activities. Do the peaks in the lynx graph line up exactly with the peaks in the hares graph? Standards Grade 6 Ecology (Life Sciences) Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As an example, we will look closely at the relationship between the Canada lynx and its primary prey, the snowshoe hare - an example touted in nearly every ecology textbook and population biology course. There are many reasons for population change - limited resources, predator-prey cycles, human _____. This is essential! For students only recently introduced to graphing, consider giving students the completed graph and carefully walk them through its interpretation. Much of this debate centers on the growing human population of the planet and the simultaneously diminishing environmental resources. Global population data can be found at the Global Population Database. Give students the handout and read the first paragraphs together. As a basis for understanding this concept: Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs. A scientific review article (Krebs, C. Why do you think this happens? _____The decreasing Hare population would cause a decrease in the Lynx population. They created a superb series of lessons about the Channel Islands in California called "From Shore to Sea". Lastly, there is evidence that at the peak population levels, the hares become so stressed by the increasing numbers of predators that they no longer reproduce at the same rate. Going Further The JASON project, provides a year long, interdisciplinary curriculum linked to real world scientific expeditions. Is the presence of more lynx helping the hares or hurting them? Why do you think that the numbers of hares is decreasing at this time? Think about what is happening to the hares at this time. When the hare population increases, what happens to the lynx population? Look at the lynx population in 1903 and 1904. Yet there are many competing theories to explain why the populations cycle in so dramatic a fashion. Getting Ready Make copies of the handouts for the students (either copy the entire handout if using the questions or just the first page and the graph page if the interpretation of the data will be done as a whole class discussion). e. Although the subtleties of these theories may be too complex for the typical middle schooler, their understanding of food webs and intuitive understanding of predator-prey relationships will likely enable them to piece together the general picture well enough for it to make sense. Graph the data, either together as a class using the teacher overhead, or individually.