



### Science Objectives

- Students will analyze a predator prey graph that represents the population cycling of the lynx and the snowshoe hare.
- Students will hypothesize what is actually occurring at different points of the predator prey graph.
- Students will predict future trends that will occur in a predator prey population.

### Vocabulary

- population cycling
- predator
- prey

### About the Lesson

- This lesson *Arctic\_Wars\_Lynx\_vs\_Snowshoe\_Hare.tns* involves investigating population cycling patterns that exist between a predator and its prey.
- As a result, students will:
  - Interact with a given situation to make predictions in an unknown situation.
  - Draw conclusions from graphs.
  - Predict future trends that will occur in a predator prey population.

### TI-Nspire™ Navigator™

- Send out the *Arctic\_Wars\_Lynx\_vs\_Snowshoe\_Hare.tns* file.
- Monitor student progress using Screen Capture.
- Use Live Presenter to spotlight student answers.

### Activity Materials

- *Arctic\_Wars\_Lynx\_vs\_Snowshoe\_Hare.tns* document
- TI-Nspire™ Technology



### TI-Nspire™ Technology Skills:

- Download a TI-Nspire document
- Open a document
- Move between pages

### Tech Tips:

Make sure students understand how to select an answer to a question using

### Lesson Materials:

#### Student Activity

- *Arctic\_Wars\_Lynx\_vs\_Snowshoe\_Hare\_Student.doc*
- *Arctic\_Wars\_Lynx\_vs\_Snowshoe\_Hare\_Student.pdf*

#### TI-Nspire document

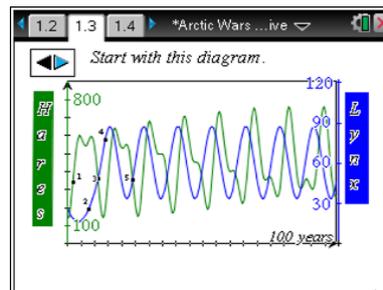
- *Arctic\_Wars\_Lynx\_vs\_Snowshoe\_Hare.tns*



## Discussion Points and Possible Answers

Move to page 1.3.

1. Have students answer Questions 1 and 2 on either the handheld, on the activity sheet, or both. Answer Questions 3 and 4 on the activity sheet.



- Q1. What is happening at Point 1 on the graph?

**Answer:** B. The prey population is rapidly increasing.

### TI-Nspire Navigator Opportunities

It may be helpful to display the graph for the class to see the individual points being discussed.

- Q2. What is happening at Point 2 on the graph?

**Answer:** B. The predator population is gradually increasing.

- Q3. Describe what is happening at Point 3 on the graph.

**Possible Answer:** The predator population is increasing because of the availability of prey (food). The prey population is decreasing because of the increased predation by the predator population.

- Q4. Analyze the rest of the graph. What overall pattern does the graph indicate?

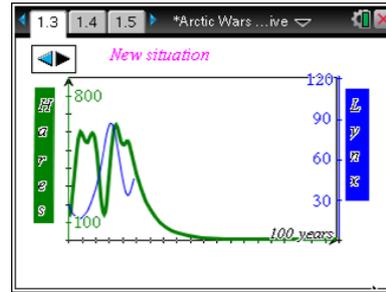
**Possible Answer:** There is a repeating pattern. Whenever the prey population peaks, the predator population increases and peaks. There is a lag between the time when the prey population peaks and the predator population peaks. The two graphs are not mirror images of each other. The same pattern occurs when the prey population decreases.

Move to page 1.5.

Have students answer Question 5 on either the handheld, on the activity sheet, or both. Have students answer questions 6–8 on the activity sheet.



2. Students will return to page 1.3, choose a new situation, and analyze the graph.



**Tech Tip:** Students just click the ► or ◀ to move between situations.

- Q5. What could have caused the hare population to behave as it did in the new situation?

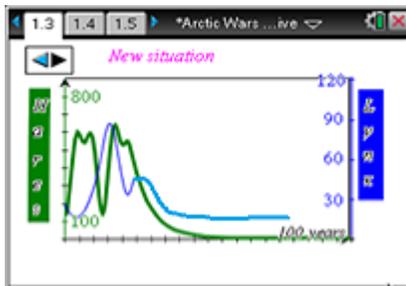
**Answer:** B. disease that affected the hares

- Q6. For each of the answer choices that you did not select in Question 5, explain why it is incorrect.

**Sample Answer:** Both choices A and D would result in an increase in the hare population. Choice C would result in a decline, but not to zero.

- Q7. On the graph below, draw a line that shows the predicted population of the lynx.

**Sample Answer:**



- Q8. Explain your rationale for the predator graph you drew in Question 7.

**Sample Answer:** Since there are other prey besides the snowshoe hare, the predator population will not decrease to zero. It will decrease sooner and to a lower point than in the previous situation. Your students might also hypothesize that another rabbit population will move in. They might also say that, because of increased habitat space, other prey populations will increase. Each scenario would depend upon the time of the year the disease outbreak occurred. Accept any answer that correctly explains the graph.

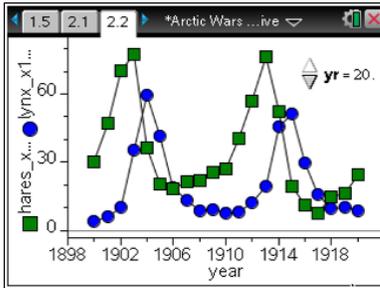
**Move to pages 2.1 and 2.2.**

Have students answer the question on either the handheld, on the activity sheet, or both.



Q9. Follow the directions on page 2.1 and draw the lynx graph below.

**Sample Answer:** Sample graph shown.



**Move to page 2.3.**

Have students answer Question 10 on the activity sheet.

3. Students return to page 2.2 and add the lynx data by pressing **Menu > Plot Properties > Add Y Variable.**

Q10. How did your prediction match the actual data? Explain.

**Answer:** Answers will vary.

#### TI-Nspire Navigator Opportunities

Send out actual data from a predator prey relationship for your students to graph. Capture the graphs for class analysis. Have your students change the data and watch the changes that occur on the graph.

## Wrap Up

When students are finished with the activity, pull back the .tns file using TI-Nspire Navigator. Save grades to Portfolio. Discuss activity questions using Slide Show.

Discuss with your students the variety dynamics at work in a population. Have your students form hypotheses that include additional factors that were not included in this activity. Also discuss other predator prey relationships besides the lynx and the snowshoe hare

## Assessment

- Formative assessment will consist of questions embedded in the .tns file. The questions will be graded when the .tns file is retrieved. The Slide Show will be utilized to give students immediate feedback on their assessment.
- Summative assessment will consist of questions/problems on the chapter test.