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TI-84 in the Classroom

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Grade level(s)/Subject taught: grade 7 Science, grade 8 Science, grade 9 Living Environment (this lesson is for grade 9)

Objectives:
*Briefly review the material completed about population studies and predator prey relationships. (Example given prior was "Kaibab Deer" scenario.)
*Introduce the students to the process of graphing using TI-84 calculator. (Students will complete a graph themselves.)
*Provide students with background information and data about population studies of lynx and snowshoe hare.
*Students will understand and be able to explain the relationship between the two species.

State Standards:
Living Environment Core Curriculum Guide
Standard 4
Performance Indicator(s)
1.1d :   The interdependence of organisms in an established ecosystem often results in approximate stability over hundreds and thousands of years. For example, as one population increases, it is held in check by one or more environmental factors or another species.

1.1f : Every population is linked, directly or indirectly, with many others in an ecosystem. Disruptions in the numbers and types of species and environmental changes can upset ecosystem stability.

Prompts:
1. How will you assess the prior knowledge of the student?
2. How will you begin the lesson?
3. What are the teacher and students doing every 5-10 minutes? (Teacher Actions and Student Actions
4. How will you assess the learning for the lesson?

1. Assessment of prior knowledge:
At the start of class there will be a 5 question mini quiz. The "mini quiz" will be based on information about the Kaibab deer and mountain lions. Students will hand in their papers. Next the teacher will review the answers with the class. (Soliciting students to answer.)

2. How will you begin the lesson?
After the "mini quiz" has been reviewed the teacher will pass out sheets on lynx and snowshoe hare.
Students will read over as a class.
The teacher will then go over the expectations (objectives) for the lesson.

3. What are the teacher and students doing every 5-10 minutes?
Students will be using the graphing calculators as the teacher guides them through each step.
The teacher will have the screen of his/her calculator projected onto the wall for students to follow along with.
The teacher will be modeling and explaining each step.
The teacher will also circulate around the room to "troubleshoot" any issues.
The teacher will ask the students to look at and to interpret the data they have graphed.

4. How will you assess the learning for the lesson?
The students will be expected to hand in the completed worksheet.
The students will also be expected to draw a graph of the data "the old fashioned way" using a pencil and graph paper.
Students will be assessed by a rubric. This rubric will be used to assess student classroom performance as well as their completion of the activity (which includes the conclusion questions from the worksheet.)

RUBRIC:

Criteria	1	2	3	4
Performance (calculator use)	Often does not follow steps	Some level of effectiveness is seen when steps are being completed.	Completes the steps required and is usually accurate.	Independently completes the steps required with a high degree of accuracy
Understanding (answering questions)	Demonstrates little understanding of the main concept. No questions were answered correctly from the conclusion.	Demonstrates an understanding of the main concepts. On question was answered correctly from the conclusion.	Demonstrates a partial understanding of the main concepts. Two questions were answered correctly from the conclusion.	Demonstrates little understanding of the main concepts. All questions were answered correctly from the conclusion.
Effort/Timeliness (self explanatory)	Assignment was submitted more than one day after it was due.	Assignment was submitted the day after it was due.	Assignment was submitted the day it was due, but after student's class.	Assignment was submitted at the time it was due.

SNOWSHOE HARE AND THE LYNX

Background: The snowshoe hare is an herbivore while the lynx is a carnivore and predator of the hare. Herbivores and carnivores tend to have very different breeding patterns that affect how the total population number change in their respective species. The predator/prey relationship explains that an increase in the snowshoe hare population (prey) leads to an increase in the lynx population (predator). The increase of the hare population (due to the vegetation growing season, not just the absence of lynx) leads to the increase of the lynx population. Eventually the increase in lynx population (along with the annual change in vegetation) impacts the hare's base population number and the hare population falls off. Then the lynx population decreases. Source: http://palm.sri.com/tasks/6-8/ME406/rubric.html

Materials: worksheet, TI-84 calculator, projection screen

Procedure:
1. Graph the Lynx and Snowshoe Hare data below.
2. You will use the TI-84 calculator to graph the data.
3. You will complete the conclusion questions and create a handwritten graph of the data, all to be turned in at the start of the next class.

Data:

Lynx and Snowshoe Hare Pop. Data (n x 1000)		
Year	Lynx	Hare
1845	30	20
1850	10	80
1855	35	82
1860	10	15
1865	75	130
1875	55	100
1880	20	15
1885	84	135
1890	20	40
1895	58	82
1905	63	65
1910	5	40
1915	52	10
1920	12	85
1925	62	5

Conclusion:
In paragraph form please discuss the following questions. There is a minimum requirement of five sentences.
*What does the chart show?
*Explain the relationship between the lynx and the hare.
*What factors in the environment can influence population numbers?