Examining Populations

Key Question: What natural factors keep populations of organisms from growing forever?

Learning Objectives:

SE3 Analyze population dynamics within an ecosystem:
   1. Explain various ways in which natural populations maintain equilibrium and relate this equilibrium to the resource limits of an ecosystem.

   2. Construct and/or interpret graphs of population dynamics.

Learning Event:

Set: On an overhead projector or data projector show the population graph for the world throughout history (http://www.susps.org/overview/numbers.html)

Ask the students what they notice about the graph and have them describe what they see. Key points that you want to gather from the students are as follows:

- The population of the world started low and remained consistently low for a long time.

- When the populations started to climb it makes a dramatic increase (it increases exponentially)

- Identify the key events that allowed the population to grow (industrialization, medicine, exploration, etc.)

Once you have discussed the human population, make the connection for the students that all animal populations are subject to the same patterns and same factors.
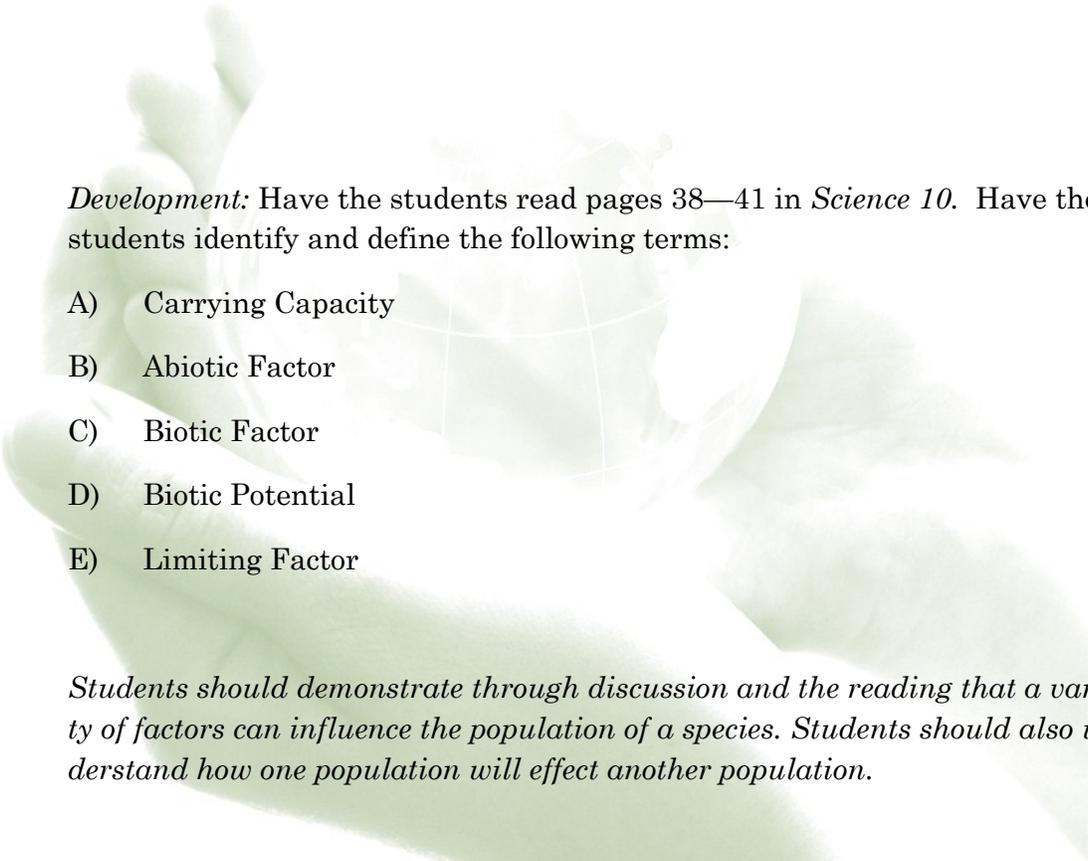
Development: Have the students read pages 38—41 in *Science 10*. Have the students identify and define the following terms:

A)   Carrying Capacity

B)   Abiotic Factor

C)   Biotic Factor

D)   Biotic Potential

E)   Limiting Factor

Students should demonstrate through discussion and the reading that a variety of factors can influence the population of a species. Students should also understand how one population will effect another population.

Once students demonstrate an understanding of what and how populations are influenced, have them complete the following research assignment. The assignment can be assessed using a research rubric such as the one found here: http://web.rbe.sk.ca/assessment/rubrics/

Adaptation:

Students that are interested in researching their own topic or need a greater challenge can work on an alternative research project that taps into their own interest. Alternative topics can include:

⇒   Why there is a bag limit for deer, elk, moose, etc.?
⇒   What would happen if the population of hunted animals was no longer controlled by hunting?
⇒   What happened to the Bison or Dodo populations with unchecked human interferences?

Population Factors

In November of 2009, the Saskatchewan Government put a bounty on the heads of all Coyotes in the province. (http://www.gov.sk.ca/news?newsId=c533b51a-71ad-4e88-a940-370a0670e9d0). Research this program and it's effects on the ecosystems of the province.

Key Questions that need to be answered:

1. What population factors have influenced the population growth of Coyotes?

2. Why is the Coyote population considered a problem for humans?

3. What abiotic and biotic factors are affecting the Coyote population?

4. How does the government program aim to control the Coyote population?

5. Do you think that this is an effective management strategy? Justify your answer.

6. Find another example of how humans have tried to influence natural populations of wildlife. Have they been successful? Explain.

Helpful Resources:

http://www.gov.sk.ca/adx/aspx/adxGetMedia.aspx?mediaId=993&PN=Shared

http://www.gov.sk.ca/news?newsId=91315bf4-90dc-4620-ad3e-f912a72d6a5d

http://www.gov.sk.ca/news?newsId=de9873af-ee6e-4797-8e3a-54a666a8258f