Population Growth and Balance
Fundamentals of Populations and Population Growth
Growth Rate Curves
http://www.arcytech.org/java/population/index.html

Navigation Instructions: Click on

- Introduction - Population Growth and Balance
- Fundamentals of Populations and Population Growth

Read the information presented and answer the following questions.

1. What defines the complexity of an ecosystem?

2. What is the objective of an ecologist?

3. Read the definition of a population. Analyze and answer the questions below.

    a. Do squirrels and chipmunks belong to the same population? Why or why not?

    b. Do the squirrels that inhabit 2 different city parks separated by an interstate highway belong to the same population? Why or why not?

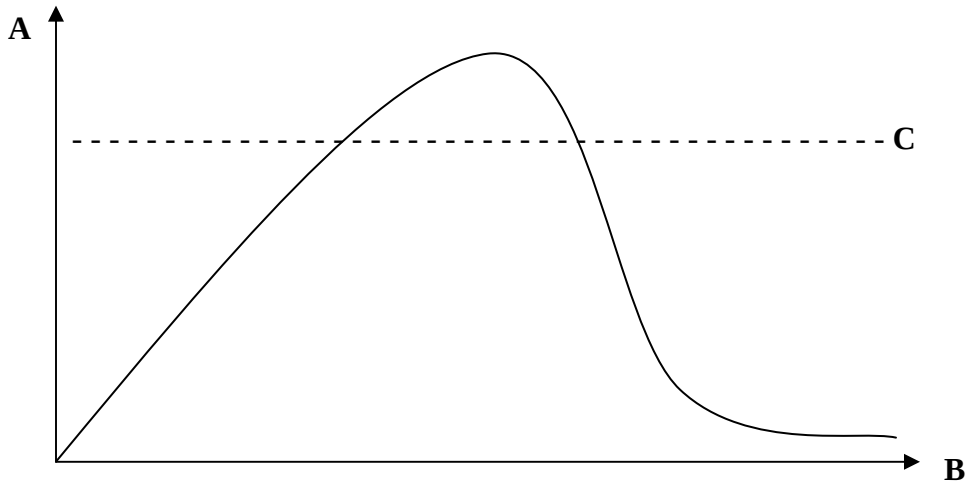
4. Population numbers (density) change due to 4 different parameters; births, deaths, immigration, and emigration. Identify which of these increase population densities and which decrease population densities.

INCREASE **DECREASE**

5. Is a growth rate that represents biotic potential typical or rarely seen? Why?

6. When a population does grow at its biotic potential, what type of growth rate pattern occurs?

7. This type of growth rate is represented in the graph below.



   a. Which axis is indicated by "A"_____ and is it the independent or dependent variable?_____

   b. Which axis is indicated by "B"_____ and is it the independent or dependent variable?_____

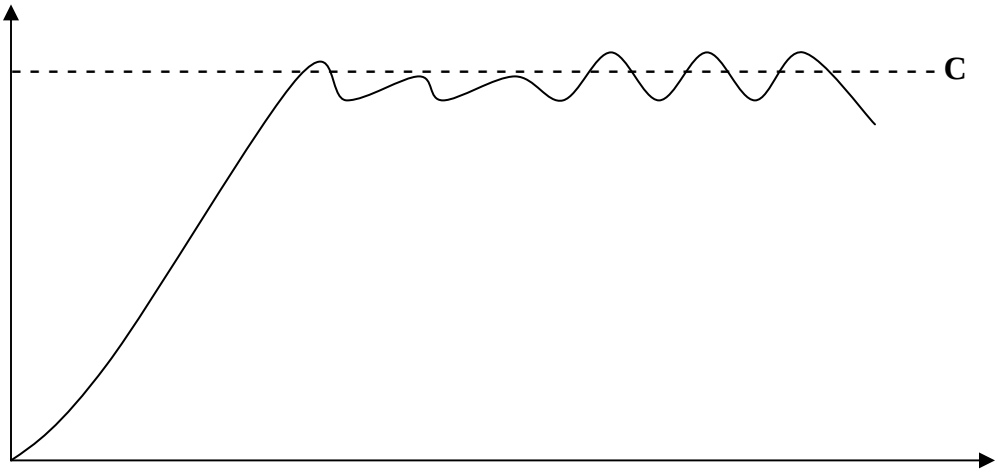
c. Which axis plots the population density?_____

d. Which axis plots the time interval?_____

e. What happens at "C" and why?

8. What limits biotic potential? List several of these limiting factors.

9. The type of growth rate pattern that occurs when biotic potential is limited is represented in the below graph. This is a sigmoid or "S"-shaped curve.



a. What is the primary difference in the population's growth when one compares exponential to S-shaped growth?

b. How does the population's response change when it **FIRST** reaches "C"?

c. What does "C" represent on both graphs?

10. Define carrying capacity.

11. Must limiting factors always exert negative pressure against a population's growth rate? Explain.

12. A population of deer mice experienced the following changes in population density. Choose appropriate scales for each of the two axes. Plot the data from the table on a separate sheet of graph paper. Label the variables for both the x- and y-axis. Identify the approximate carrying capacity. Finally, identify whether this is an exponential or sigmoid growth curve.

Month	Population Density	
Jan '01	15	
March	12	
May	39	
July	97	
Sept	148	
Nov	103	
Jan '02	37	
March	29	
May	51	
July	126	
Sept	203	
Nov	111	
Jan '03	36	
March	17	
May	39	