

Agenda

- Homework Stamp & Check
- **Quiz 1** Make-up (Absent Students)
- Population Growth & Limiting Factors

- **2B Retake Deadline 04/18**

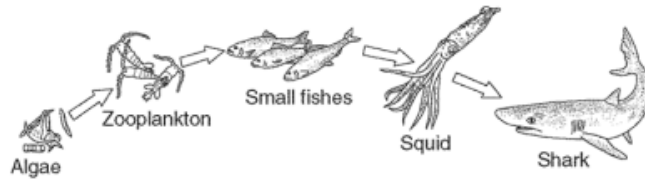
Construct a Food web below using the following animals.

SNAKE, CORN, CATERPILLAR, DEER, CROW, MOUSE, COUGAR, SQUIRREL, BACTERIA

This ecosystem represents a farm area. The corn is the main source of food for many of the herbivores in the area. Label each organism with all correct vocabulary words from p. 68 in notebook.

Food Webs & Energy Pyramid Practice

1. What is the producer for marine food chain shown?
2. What do small fish eat?
3. Who is the 3rd order consumer?
4. Who is the primary consumer?
5. Who eats zooplankton?
6. Why are food chains not a very good representation of the way feeding relationships actually work in nature?



Use the food web below to answer the questions.

7. Who is the producer? How do you know?

8. Name the organisms that ONLY function as primary consumers.

9. Would a decline in the penguin population affect the elephant seal population? Explain.

10. How many trophic levels does the cod function at? _____

11. What affect would a declining penguin population have on leopard seals? Explain.

12. Would a decline in krill have a greater effect on Crabeater seals or Elephant Seals? Explain.

13. What would be worse for most members of this food web: 1) a major decline in the leopard seal population or 2) a major decline in the Crabeater seal population? Explain your answer.

14. Write a food chain that ends with the killer whale as a 2nd consumer, 3rd order consumer, 4th order consumer, 5th order consumer

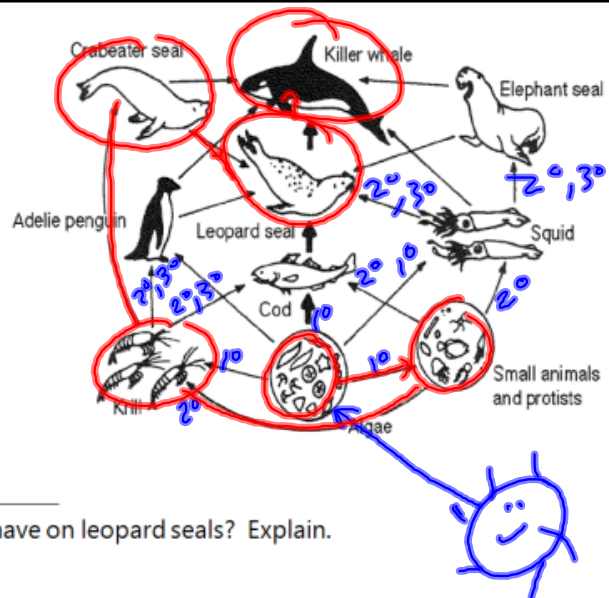
_____ → _____ → Killer whale

_____ → _____ → _____ → Killer whale

_____ → _____ → _____ → _____ → Killer whale

_____ → _____ → _____ → _____ → _____ → Killer whale

15. Why are food webs better than food chains at representing feeding relationships in ecosystems?



16. In an ecological pyramid, what happens to energy and # of species as you move up? *Why?*

- a. In an ecosystem, can there be more carnivores than herbivores? *Explain* why or why not?
- b. What is the 10% rule? What is its significance? Why is energy lost?

c. Label the ecological pyramid with the following words: producers, tertiary consumer, secondary consumer, primary consumer, decomposers, cottonwood, bear, Elk, Wolf, rabbit, coyote.

d. Brainstorm to create a list of 4 human activities that interfere with ecosystems, food chains and food webs. For each explain how it happens, why we do it, and mention short and long-term effects.

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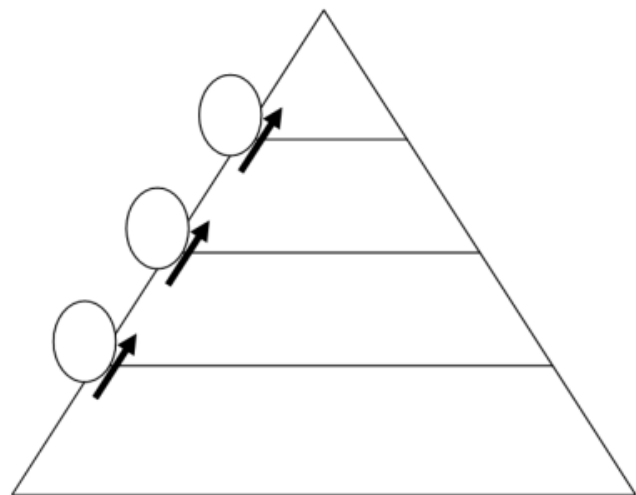


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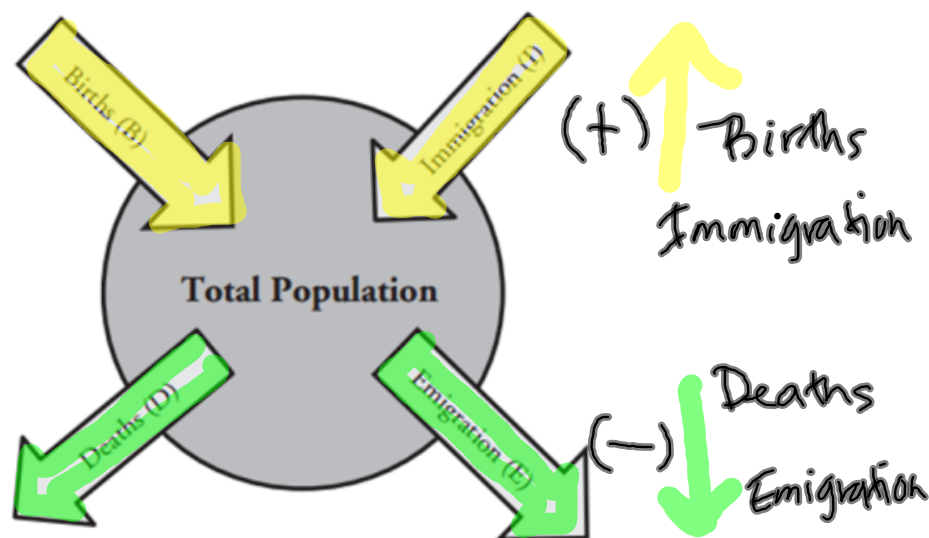
Population Growth

How is population growth naturally regulated?

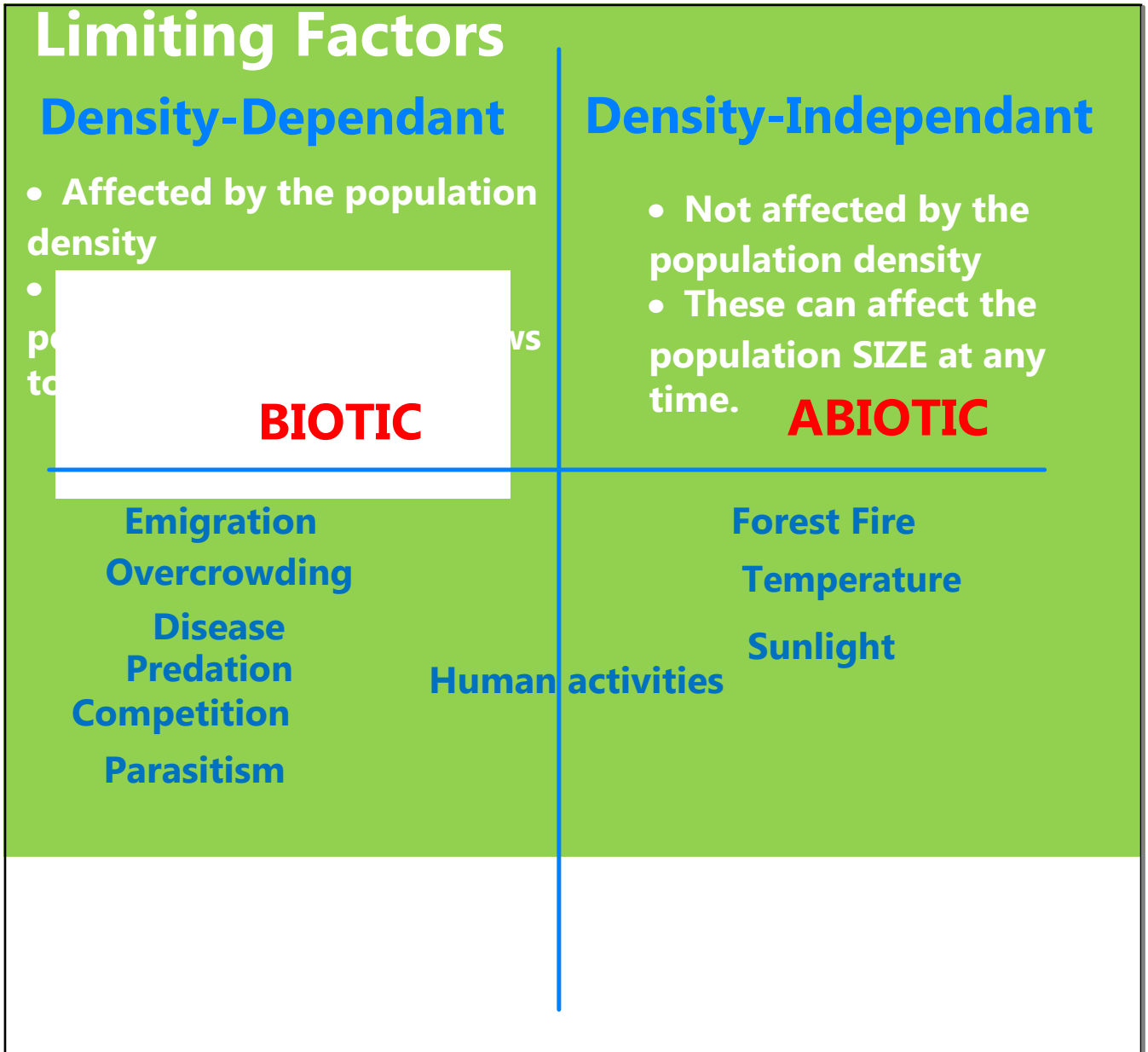
Why?

The current world population is estimated to be over 7 billion. At present the number of births annually exceeds the number of deaths, which means that the population is increasing, and is estimated to reach 9 billion by 2040. In 1750 the world population was estimated at less than 800 million. How are growing populations such as ours controlled and supported, and can they continue to grow indefinitely?

Model 1 – Population Growth



1. Refer to Model 1.
 - a. What is the term used for populations moving into an area?
 - b. What is the term used for populations leaving an area?
 - c. Name two factors that cause an increase in the population size.
 - d. Name two factors that cause a decrease in population size.



Limiting factors limit population growth.

- A limiting factor is something that keeps the size of a population down.

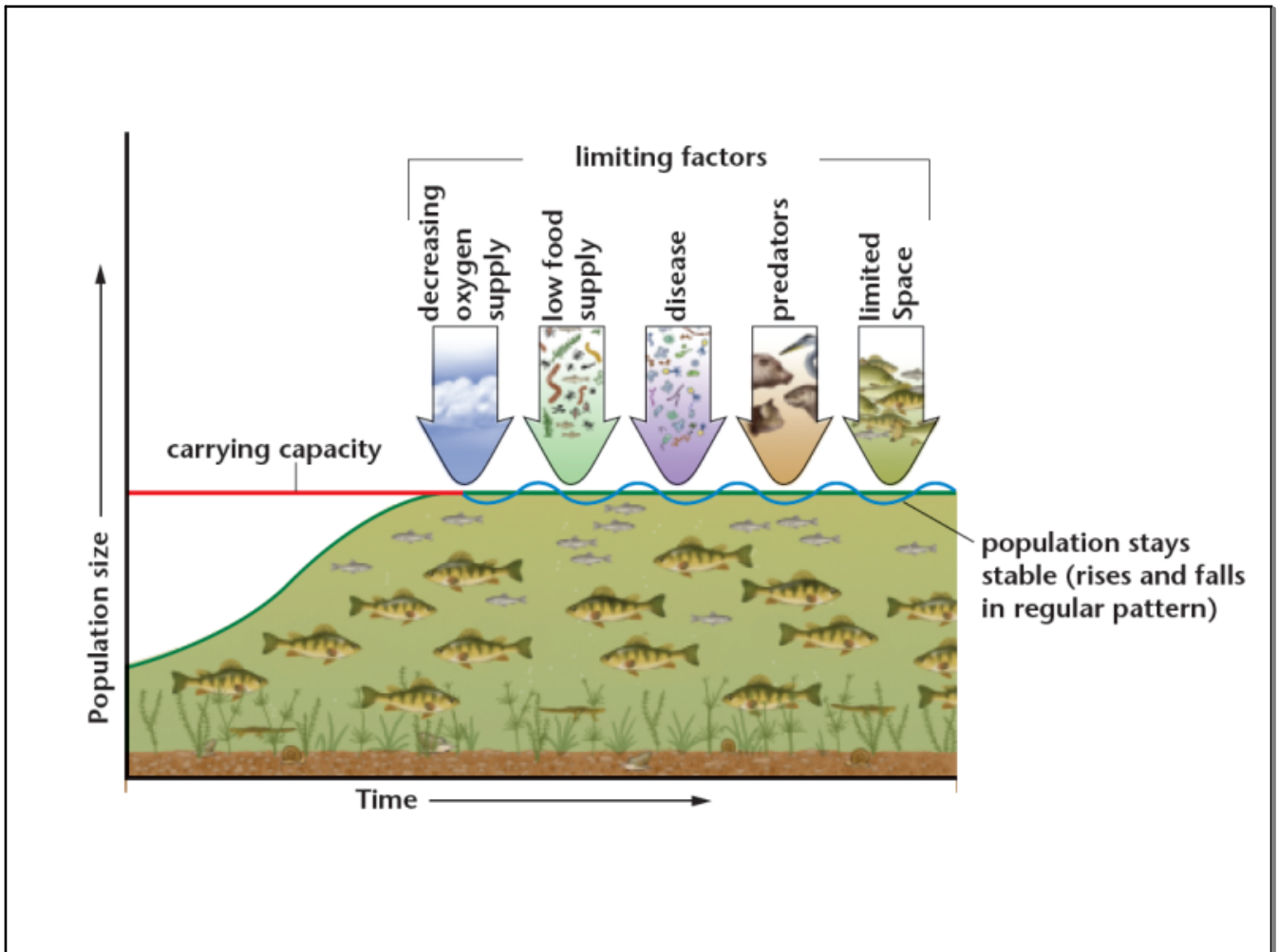


Limiting Factors

1. Density Dependent:	2. Density-Independent:
Is this a biotic or abiotic factor?	Is this a biotic or abiotic factor?

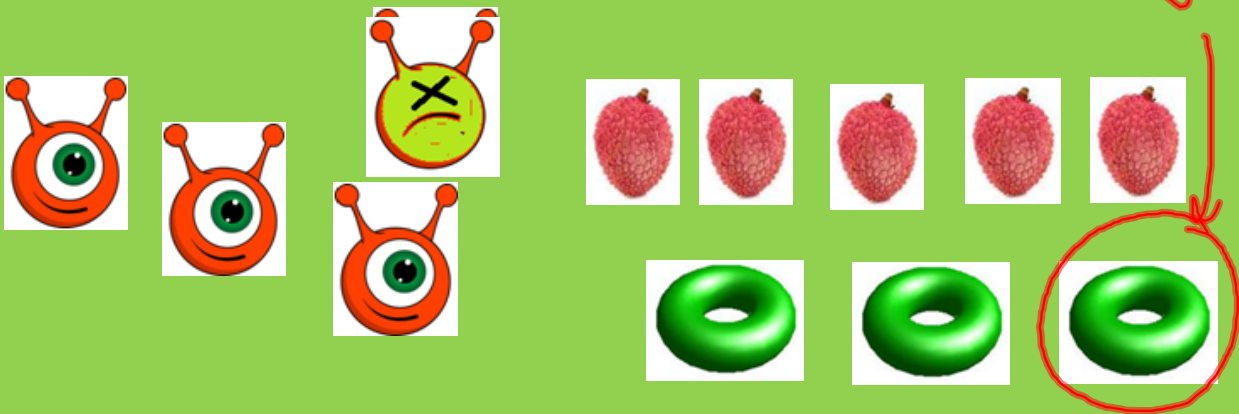
Read each situation in the chart below. Then, state if it is a density-independent limiting factor or a density-dependent limiting factor. Then, state the specific limiting factor that is occurring. The first one is done for you as an example.

Situation	Density-independent, or density-dependent?	Limiting Factor:
Ms. Darlak has 32 students assigned to her Biology class, but she only has room for 28. Because the room is so crowded, the extra 4 students leave the room to go to Counseling and have their schedules changed.	density-dependent	emigration
Northern pike (it's a fish) feed on another fish, the yellow perch. An increase in the yellow perch population causes an increase in the northern pike population.	DD	predation
The BP oil spill in the Gulf of Mexico has harmed many aquatic organisms that live in the Gulf region.	DI	human activity
A new strain of influenza (the flu) breaks out in New York City.	DD	Disease
A population of rabbits and a population of deer are both feeding off the same plants in the same habitat.	DD	Compet
Hurricane Katrina forced thousands of people to leave New Orleans.	DI	Natural Disaster
65 million years ago, a large asteroid collided with the Earth. As a result, large amounts of ash were ejected into Earth's atmosphere.	DI	Natural Disaster
Due to humans putting increasing amounts of greenhouse gases into the atmosphere and cutting down trees that would normally take up some of those gases, the Earth slowly gets warmer and changes climates around the globe.	DI → DD →	Temp humans



Can carrying capacity change over time?

- Limiting factors can alter the carrying capacity
- The orange aliens each need a lychee and a quib to survive.
- What is the carrying capacity?
- What is the limiting factor?



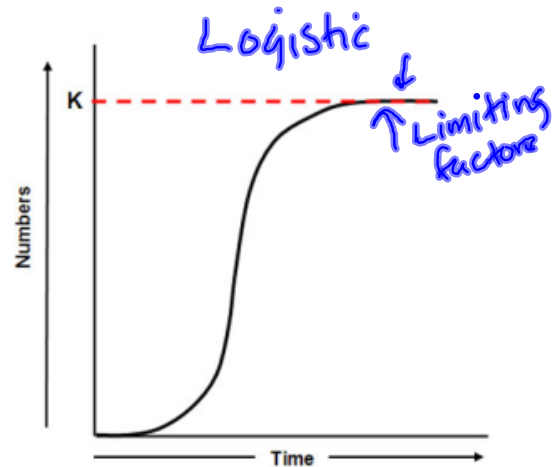
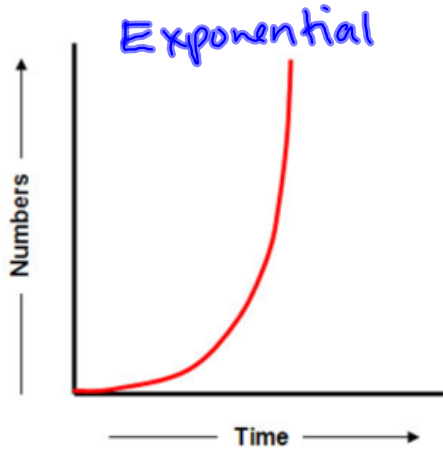
Can carrying capacity change over time?

- A drought results in fewer lychees.
- What is the new carrying capacity?
- What is the new limiting factor?

2



Carrying Capacity & Growth Curves



1. Complete the following table for the two types of growth curves:

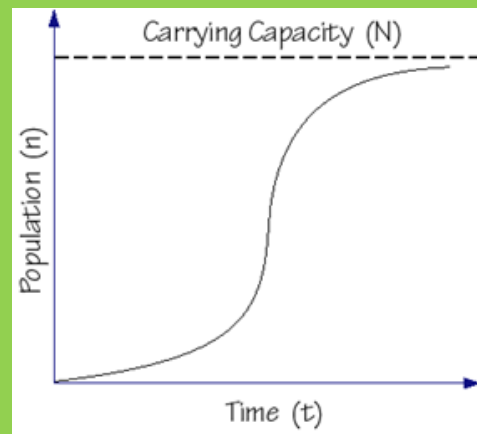
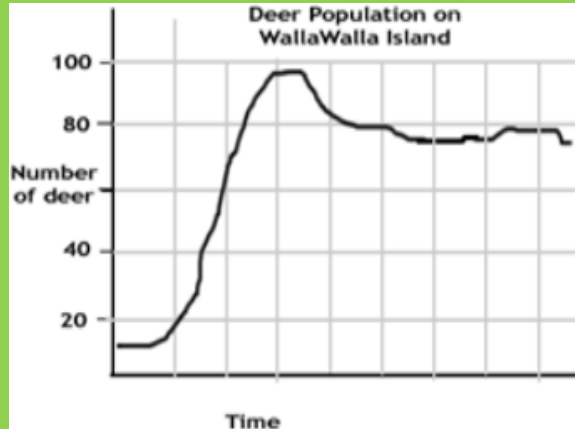
growth curve	shows unlimited, unchecked growth	growth limited by extrinsic or intrinsic factors	shape of curve (S or J)	shows (K) carrying capacity for a population.	typical of short term or long term growth
exponential	X		J		Short
logistic		X	S	X	Long

2. Directions: For each of the following scenarios circle whether the population growth would best be represented by a logistic or exponential growth curve.

- a. a strep bacterium invades your throat and reproduces for 4 hours
 exponential logistic
- b. the flea population on a rat is monitored for 5 weeks with flea powder added **LF**
 exponential logistic
- c. loggerhead turtle populations are tracked for 10 years in the Atlantic
 exponential logistic
- d. a lucky yeast cell falls into your glass of grape juice and reproduces for 3 hours
 exponential logistic
- e. bull frog population in a local pond is monitored for 5 seasons
 exponential logistic

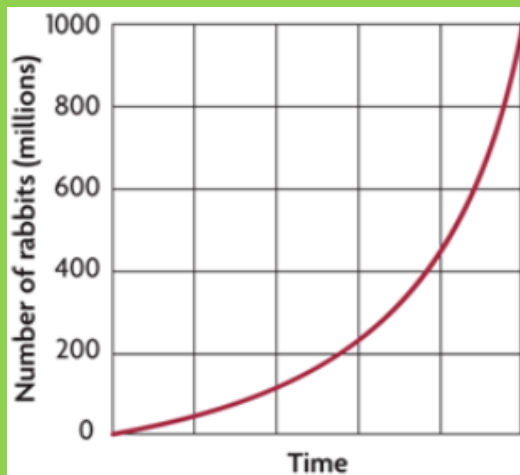
Carrying Capacity (K)

- The amount of organisms the environment can support without limiting factors
- When organisms exceed carrying capacity, limiting factors begin

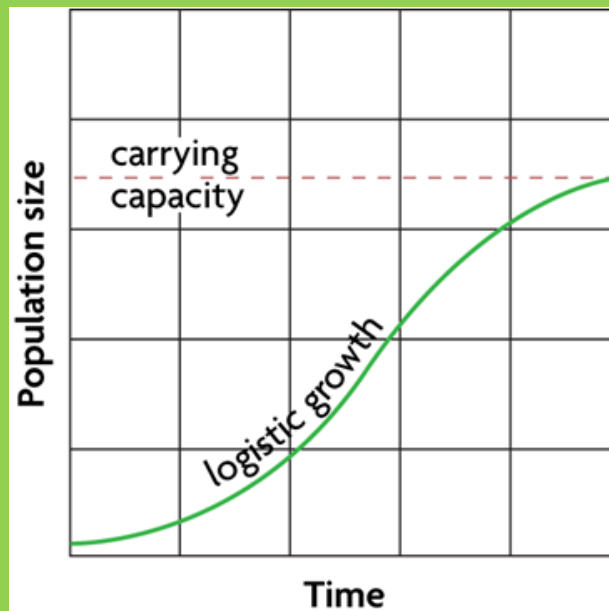


Population growth is based on available resources.

- **Exponential growth** is a rapid population increase due to an abundance of resources.



- **Logistic growth** is due to a population facing limited resources.

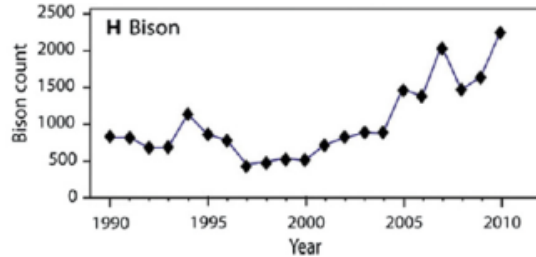
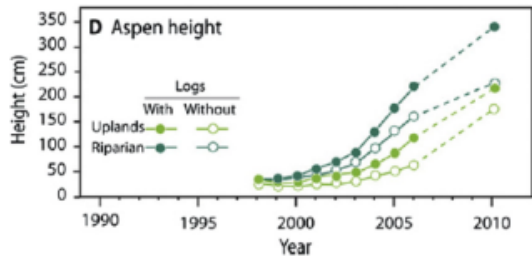
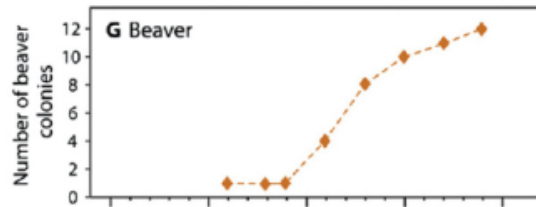
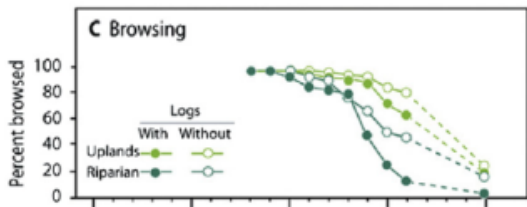
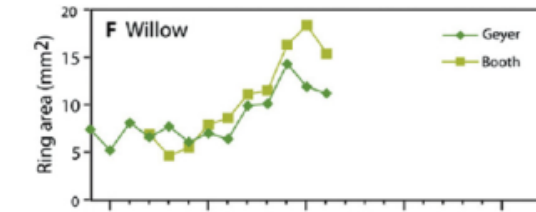
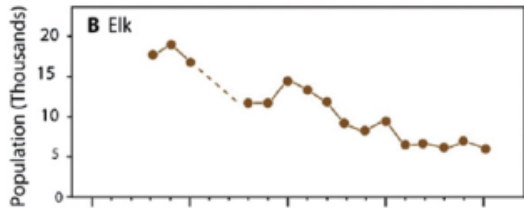
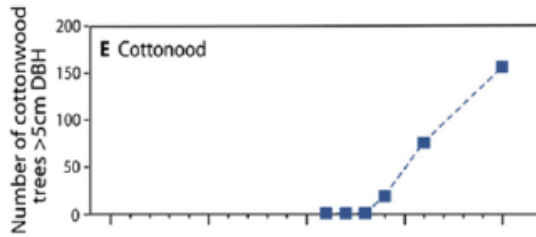
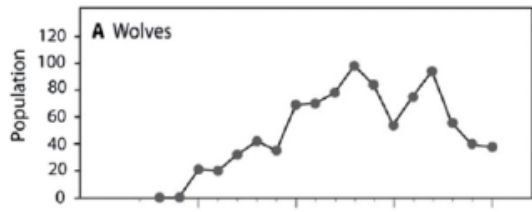


Can carrying capacity change over time?

- ults in fewer lychees.
- What is the new carrying capacity?
- What is the new limiting factor?



Warm-up



Types of Relationships

Predation +/-