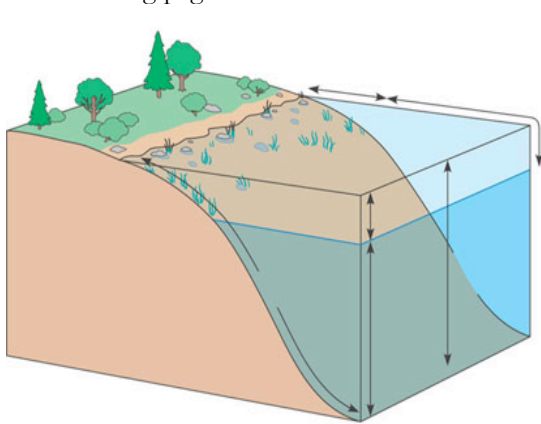


**Chapter 52: An introduction to Ecology and the Biosphere**

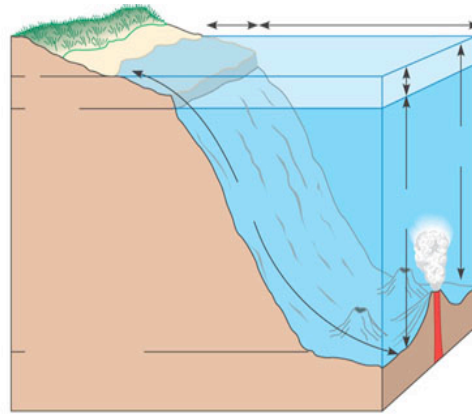
1. Define the following terms:
  - a. Abiotic
  
  
  
  - b. Biotic
  
  
  
  - c. Biota
  
  
  
  - d. Give an example of an interaction between biotic and abiotic factors.
  
2. What do the following subfields of ecology study?
  - a. Organismal ecology
  
  
  
  - b. Population ecology – include the definition of ecology
  
  
  
  - c. Community ecology – include the definition of community
  
  
  
  - d. Ecosystem ecology – include the definition of ecosystem
  
  
  
  - e. Landscape ecology
  
3. Explain the factors that affect dispersal of organisms.
  
  
  
  
  
  
  
  
  
  
4. Give two examples of the impact of abiotic factors on the distribution of organism:
  - a. Temperature
  
  
  
  - b. Water
  
  
  
  - c. Sunlight
  
  
  
  - d. Wind
  
  
  
  - e. Rocks and soil

5. What is the difference between macroclimate and microclimate?
6. How does latitude affect sunlight intensity?
7. What causes the seasons?
8. Explain how mountains affect rainfall.
9. How does seasonal turnover in lakes affect the oxygen level available to the aquatic organisms?
10. Label the below listed diagrams of aquatic and marine environments. Include a written description of the zone on the following page.



(a)

a. Aquatic



(b)

b. Marine

11. Describe the following aquatic biomes. Pay special attention to the physical environment, chemical environment, and organisms present.
  - a. Lakes

- b. Wetlands
  
- c. Streams and Rivers
  
- d. Estuaries
  
- e. Intertidal Zones
  
- f. Ocean Pelagic Biome
  
- g. Coral Reef
  
- h. Marine Benthic Zone

12. How does temperature and precipitation impact the distribution of terrestrial biomes?

13. Describe the following terrestrial biomes. Pay special attention to the distribution, precipitation, temperature and organisms present.

- a. Tropical forest
  
  
  
  
  
  
  
  
  
  
- b. Desert
  
  
  
  
  
  
  
  
  
  
- c. Savanna

- d. Chaparral
- e. Temperate grassland
- f. Coniferous forest
- g. Temperate broadleaf forest
- h. Tundra

### **Chapter 51: Behavioral Ecology**

1. How do behavioral ecologists define behavior?
2. Compare proximate questions of behavior with ultimate questions of behavior.
3. Define the following terms:
  - a. Ethology
  - b. Fixed action pattern
  - c. Sign stimulus
  - d. Imprinting
  - e. Sensitive period
  - f. Innate behavior

4. Compare and contrast kinesis and taxis. Give an example of each.
5. What is the relationship between migration and genetic control?
6. How are the terms signal and communication related?
7. Describe and give three different examples of animal signals and communication.
8. Discuss the evidence that mating and parental behavior can be under genetic influence.
9. Define the following terms:
  - a. Learning
  - b. Habituation
  - c. Spatial learning
  - d. Cognitive map
  - e. Associative learning
  - f. Classical conditioning
  - g. Operant conditioning
10. Describe the classic experiment done by Tinbergen dealing with wasps. Why is this experiment considered important?
11. Describe the field of “cognitive ethology”.

12. Explain why natural selection can act on organismal behavior.
13. Explain the optimal foraging theory.
14. Generally, what is the most important factor in the evolution of mating systems?
15. Explain what agonistic behavior is. Include proximate and ultimate causes of this behavior.
16. How can we use game theory to study animal behavior. Provide an example.
17. Define the following terms:
  - a. Altruism
  - b. Inclusive fitness
  - c. Coefficient of relatedness
  - d. Kin selection
18. Is reciprocal altruism common in animals? Why or why not?
19. What is the relationship between social learning and culture?

### **Chapter 53: Population Ecology**

1. Define the following terms:
  - a. Population
  - b. Density

c. Dispersion

d. Mark-recapture method

e. Immigration

f. Emigration

g. Territoriality

2. Compare and contrast the three patterns of dispersal shown in organisms.

3. Define the following terms:

a. Demography

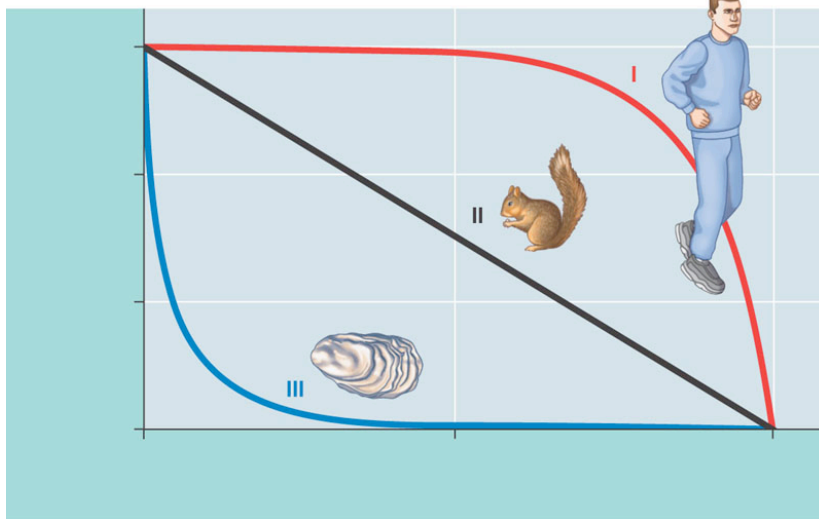
b. Life tables

c. Survivorship curves

d. Reproductive table

e. Life history

4. Label the three different survivorship curves on the diagram below. Give an example of an animal that fits the curve and an explanation of why they fit the curve.

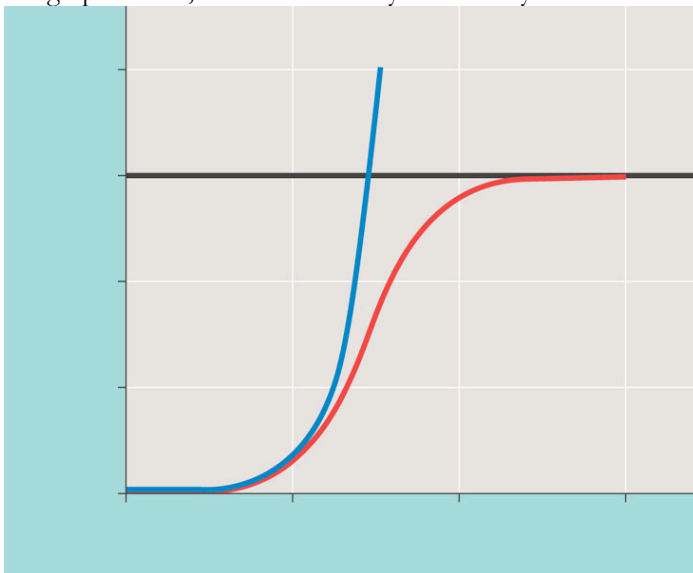


5. Compare and contrast semelparity and iteroparity. Give advantages of each as they apply to an example organism. Focus on the adaptive benefit of the life history. Are there any disadvantages? If so, what are they?

6. What is zero population growth?

7. What is exponential population growth? Sketch the kind of graph would you expect to see?

8. Explain why the logistical population growth model can accurately model populations in the environment. Look at the graph below, what does it tell you and why? How does “K” fit in to all of this?

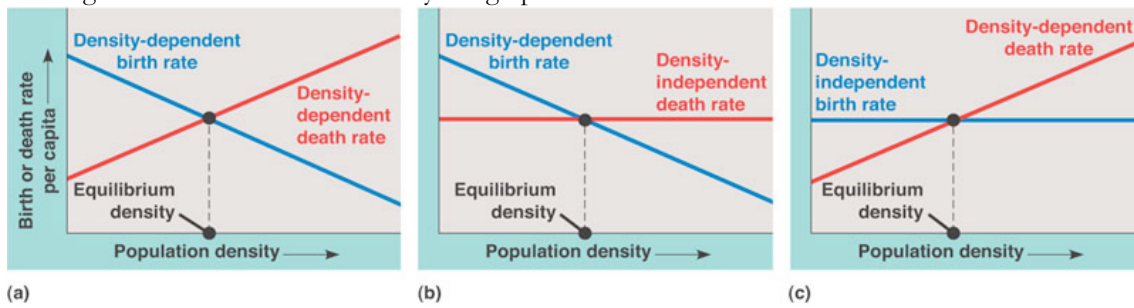


9. Compare and contrast r and k selection. Do some additional research and try to come up with at least six points of comparison.

10. What is the difference between density-dependent and density-independent factors as relates to their effect on populations?



11. What generalizations can be made by the graphs below?



12. Describe six density-dependent factors that can affect a population.

13. Explain what factors contribute to population dynamics.

14. Describe historical and current trends in the growth of the human population.

15. What kinds of information do age structure pyramids provide and what inferences can be made from these?

16. One of the key factors that contributes to a country's population growth rate is the education of women. Why is this and what effect does it have?

17. How can an ecological footprint be useful?

## Chapter 54: Community Ecology

1. Define interspecific interactions.
  
2. What is the relationship between interspecific competition and The Competitive Exclusion Principle?
  
3. Contrast the following terms: ecological niche, fundamental niche, realized niche and resource partitioning.
  
4. Give an example of character displacement.
  
5. Explain each of the following physiological defense adaptations. Give an example of each.
  - a. Cryptic coloration
  
  - b. Aposematic coloring
  
  - c. Batesian Mimicry
  
  - d. Müllerian mimicry
  
6. Give an example of a plant defense against herbivory.
  
7. Contrast the following terms:
  - a. Endoparasites
  
  - b. Ectoparasites
  
  - c. Parasitoids

8. Explain a mutualistic relationship between organisms. Provide two examples.
  
9. Explain a commensalistic relationship between organisms. Provide two examples.
  
10. Is the evolution of Batesian mimicry an example of coevolution, support your answer?
  
11. Provide an example that correctly uses the terms species diversity, species richness and relative abundance correctly.
  
12. What is the difference between a food chain and a food web? Which provides a more “full” ecological picture and why?
  
13. Explain the two hypotheses that address the question as to why food chains are relatively short.
  
14. How do you characterize a dominant species? How is this different from a keystone species?
  
15. Compare and contrast the bottom-up model with the top-down model.
  
16. Define the term “disturbance” and explain the intermediate disturbance hypothesis?

17. Compare and contrast primary and secondary succession.

18. Define “evapotranspiration.”

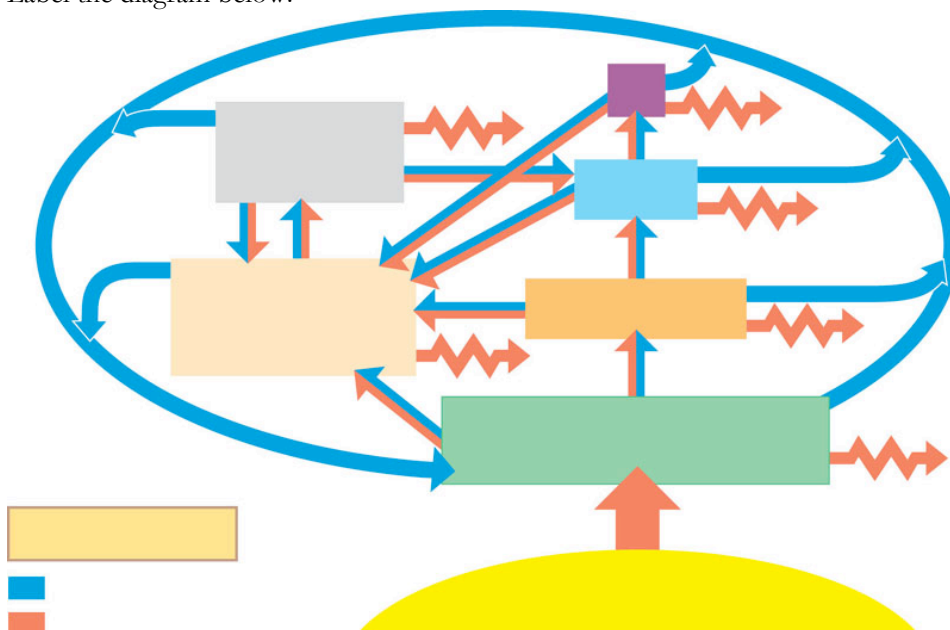
19. Explain how the Island Equilibrium Model helps us understand ecological changes?

20. Contrast the integrated hypothesis with the individualistic hypothesis.

### Chapter 55: Ecosystems

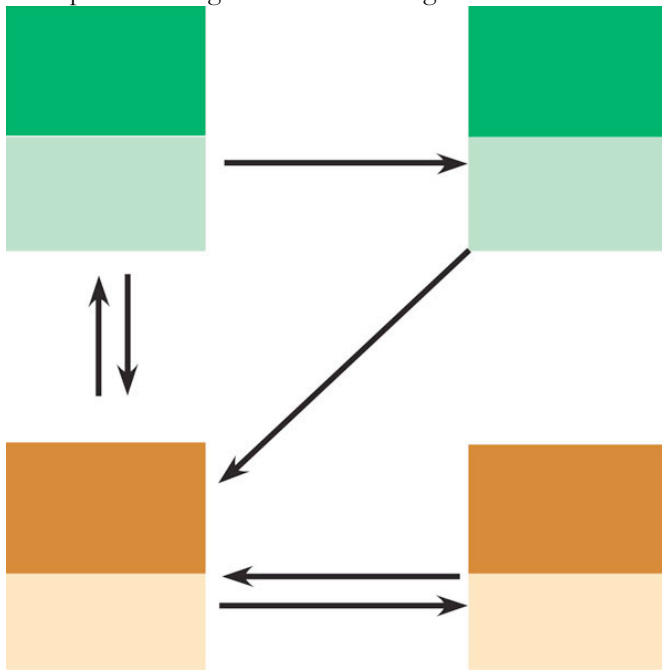
1. Explain how energy flows in relation to an ecosystem. Why do we care about this?

2. Label the diagram below.



3. Why are detritivores essential to an ecosystem?
  
4. Define the following terms:
  - a. Gross primary production
  
  
  - b. Net primary production
  
5. How do light limitations and nutrient limitations impact primary production?
  
  
  
  
  
6. Explain what “eutrophication” is and how it is caused.
  
  
  
  
  
7. What environmental factors impact evapotranspiration?
  
  
  
  
  
8. Define “secondary production.”
  
  
  
  
  
9. Why is the energy transfer between trophic levels limited?
  
  
  
  
  
10. Explain the difference between production efficiency and trophic efficiency.
  
  
  
  
  
11. Restate the “green world hypothesis” in your own words.

12. Complete the diagram below of the general model of nutrient cycling.



13. Briefly detail the water cycle. You can write this response or draw the cycle.

14. Briefly detail the carbon cycle. You can write this response or draw the cycle.







7. Contrast the “minimum viable population size” with the “effective population size.”

8. Pick one of the case studies presented in the first part of the chapter (greater prairie chickens, red-cockaded woodpeckers or grizzly bears). Explain why the population was threatened and how conservation efforts were aimed towards helping the struggling population.

9. Why is conservation always a compromise between the organism involved and human needs?

10. How do fragmentation and edges affect habitats?

11. Compare the nature reserve approaches utilized by the United States and Costa Rica.

12. What is the goal of Restoration Ecology?

13. Explain the concepts of “Bioremediation” and “Biological Augmentation.”

14. What are the goals of sustainable development?

15. What do you believe are the long-term prospects for humans and their interactions with the biosphere?