

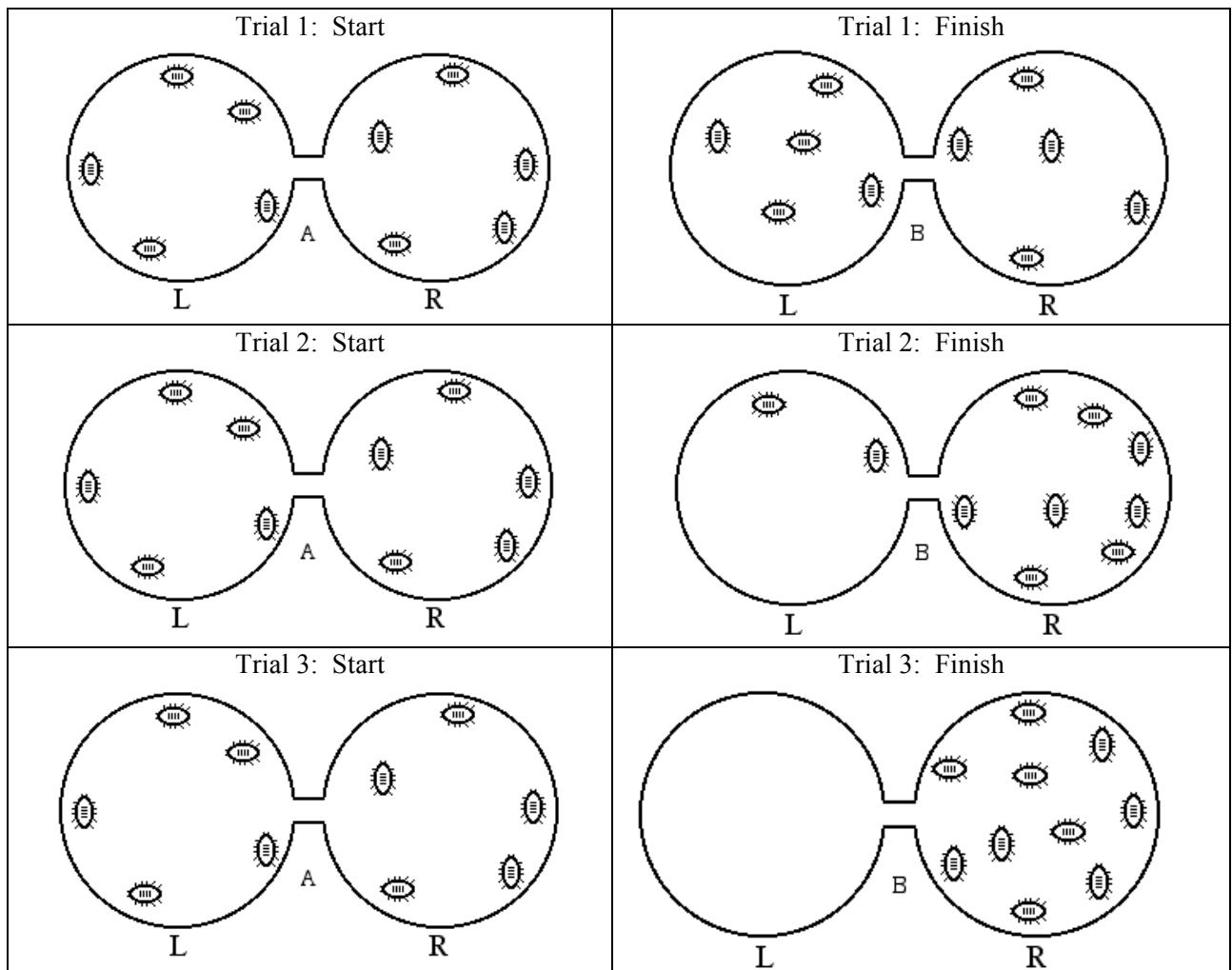
Ecology Review

Directions: Answer the questions that follow as completely as possible.

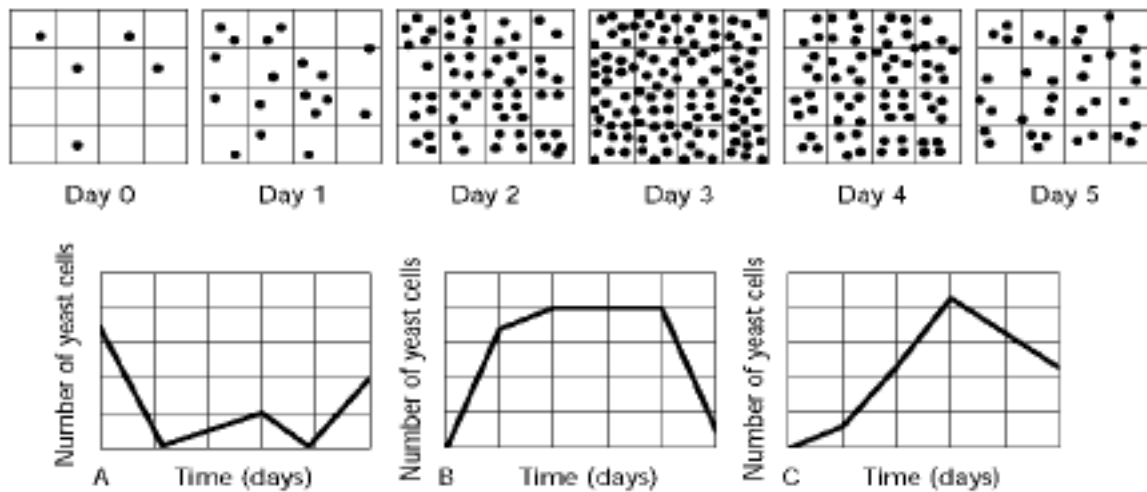
Choose from the list below for each of the following statements.

- A. Fixed action patterns B. Habituation C. Classical Conditioning D. Imprinting
 D. Operant Conditioning

2. Innate, highly stereotypic behavior that must continue until it is completed.
3. Trial and error learning.
4. Behavior that is marked by a “critical period” for its development.
5. A pillbug behavior experiment was performed using connected Petri dishes as shown in the diagrams below. Trial 1 compared wet paper on the left to wet paper on the right. Trial 2 compared dry paper on the left to wet paper on the right. Trial 3 compared vinegar-soaked paper on the left to wet paper on the right. The time between start and finish in each case was 10 minutes.
 - a. Explain the results that are depicted.
 - b. Why compare wet paper on the left to wet paper on the right?
 - c. Do any of the depicted results show pillbug preference between acid and dry environments? Explain your answer.
 - d. Develop a hypothesis that would begin each test.
 - e. How could each trial be improved to increase the importance of the results obtained?



A student grew a yeast culture on sterilized nutrient medium in a closed dish for five days. Each day, she took the same size sample from the dish and placed it on a special slide used for counting microorganisms (see the top half of Figure 4-2). She examined the samples under a microscope and drew the illustrations of her observations over the course of the investigation. Each dot represents ten yeast cells.

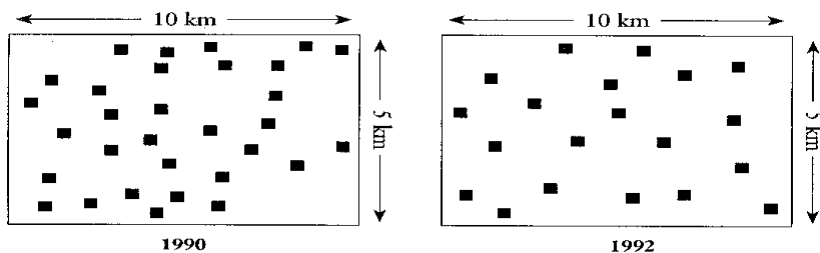


6. Which graph, A, B, or C represents the growth pattern of the student's yeast population?
 - a. Describe two factors that contribute to this pattern.

7. How many yeast cells did the student count on day 1? (SHOW YOUR WORK)

Figure 4-3 represents a population of bees occupying the same territory in the years 1990 and 1992. Each small block represents 100 bees.

Figure 4-3



8. What type of population distribution is shown in the bee population in both 1990 and 1992? What type of biotic and abiotic factors would be associated with this type of distribution?
9. What was the size of the bee population in 1990? SHOW YOUR WORK!!
10. What is the population density per square kilometer in 1992? SHOW YOUR WORK!!

In Figure 4-1, the first age structure graph for country X shows the percent of the population in each age group for the year 2000. The remaining three graphs are projections of how the age structure of country X will change.

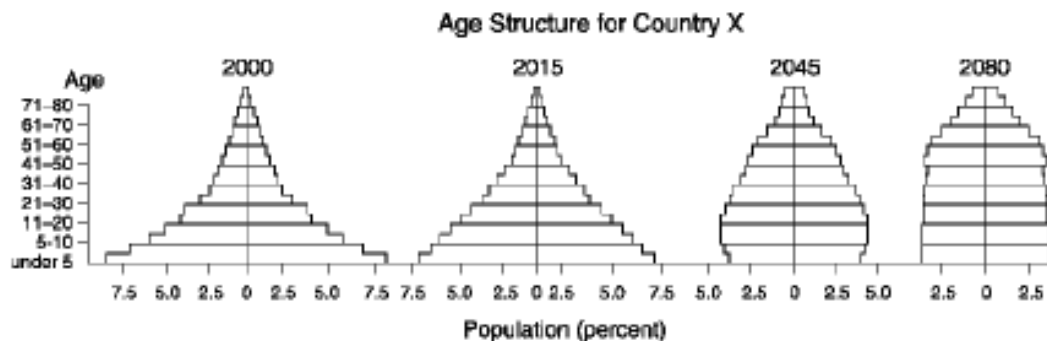


Figure 4-1

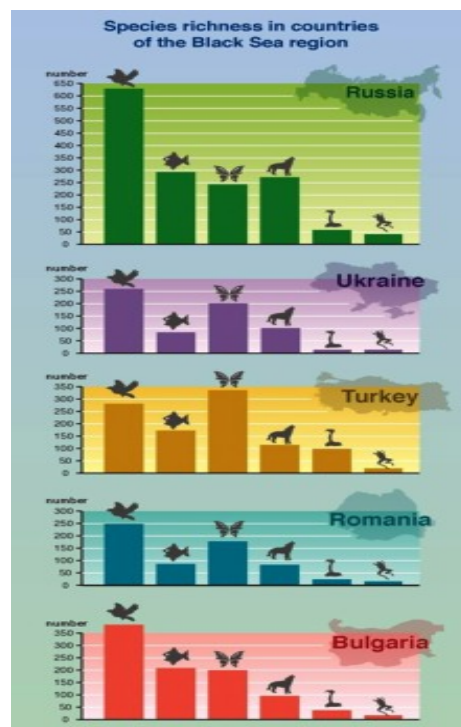
11. How do this population's birth and growth rates change over time? What "societal" factors might be associated with these changes in birth and death rates?

12. Complete the chart below as completely as possible.

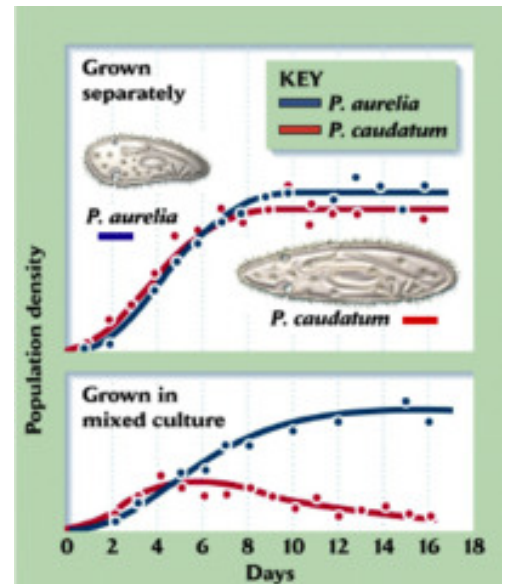
Type of Interaction	Description of the Interaction	Example	+/+, +/-, -/-, +/-, -/0
mutualism			
predation			
commensalism			
interspecific competition			
ammensalism			
parasitism			
herbivory			

13. Using the graphs at right, explain what is meant by "species richness." Compare the "species richness" in the two pictures and describe why it is important.

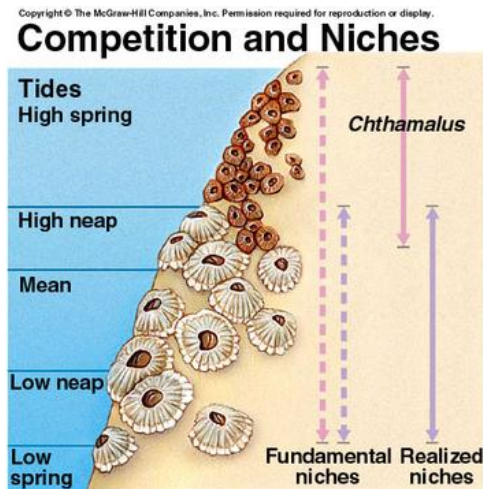
A. Which country (countries) have Black Sea regions that are less Stable? Why?



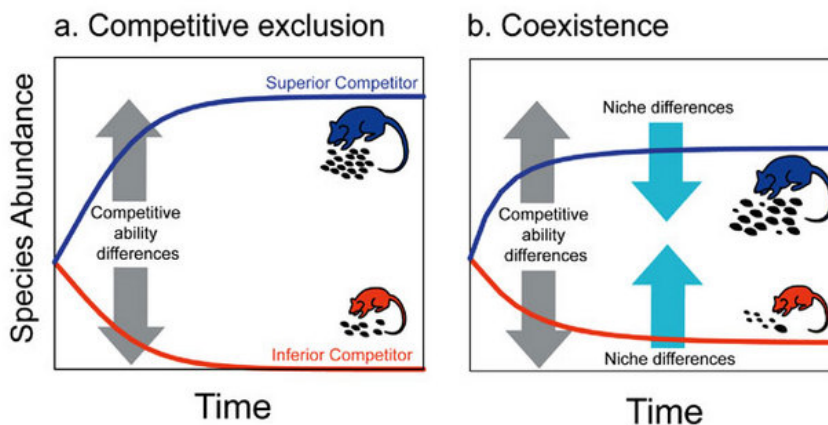
14. What principle pertaining to species interactions is illustrated in the Picture at right?



15. Using the picture below, define the term “niche” and explain the difference between a fundamental niche and a realized niche.



16. Using the picture below, explain why competition doesn't ALWAYS lead to “exclusion”. What are the conditions necessary for “coexistence”?



Abandoned cornfields have been the sites of investigations concerning ecological succession, the orderly progression of changes in the plant and/or animal life of an area over time (see Figure 1).

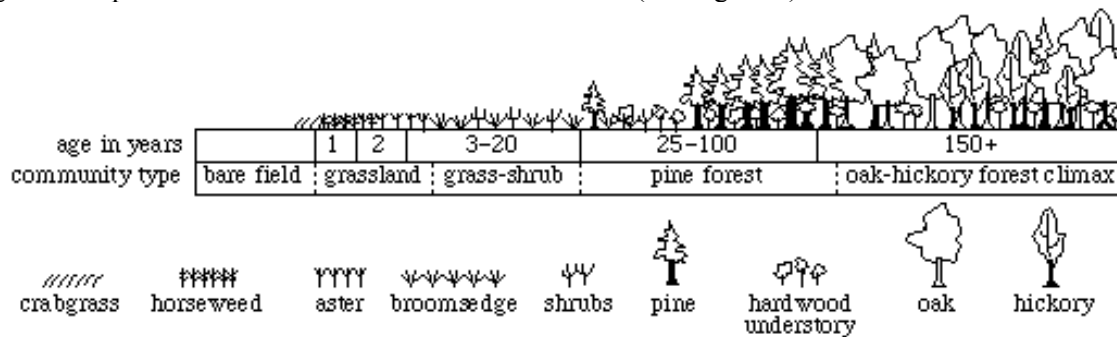


Figure 1

During the early stages of succession, the principal community (living unit) that dominates is the pioneer community. Pioneer plants are depicted in Figure 2.

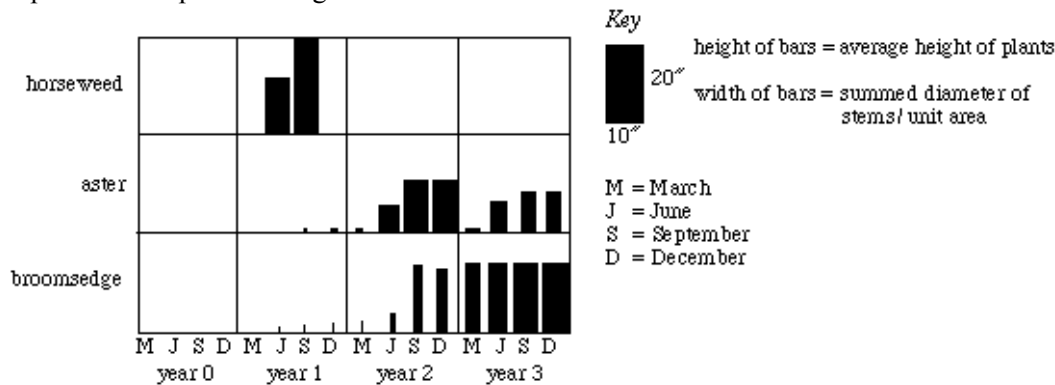


Figure 2

The final stage of ecological succession is characterized by the presence of the climax community, the oak-hickory forest. Figure 3 depicts the gradual change from pine to hardwoods.

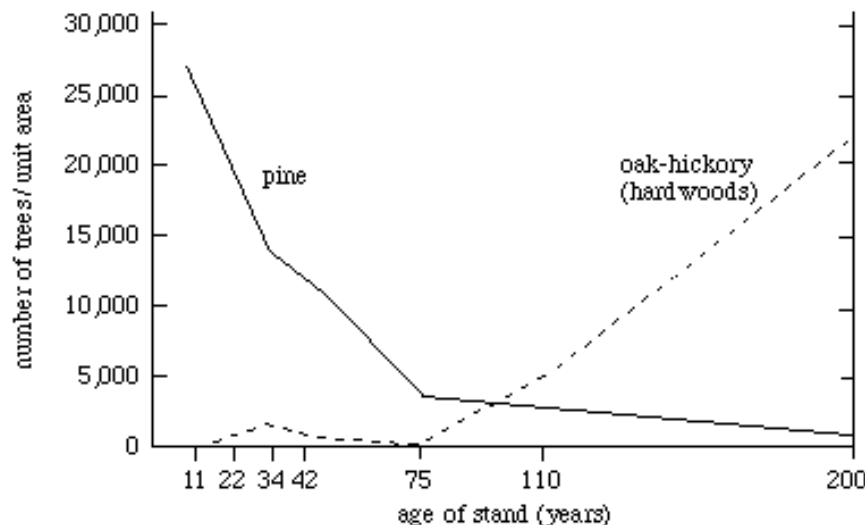
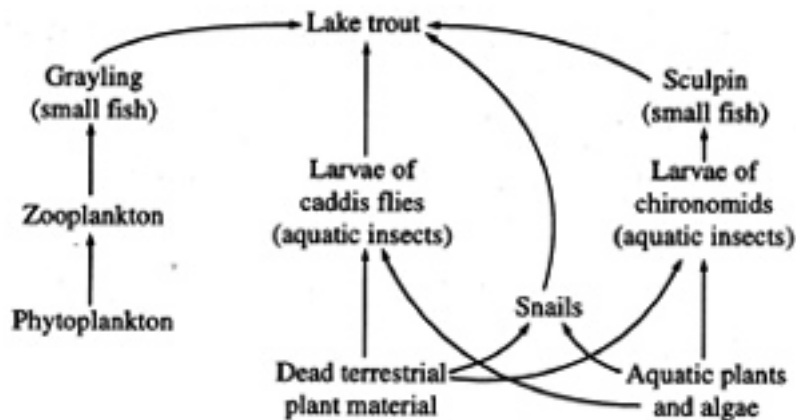


Figure 3

17. What type of succession is shown in figure 1 (primary or secondary)? Explain HOW you know.

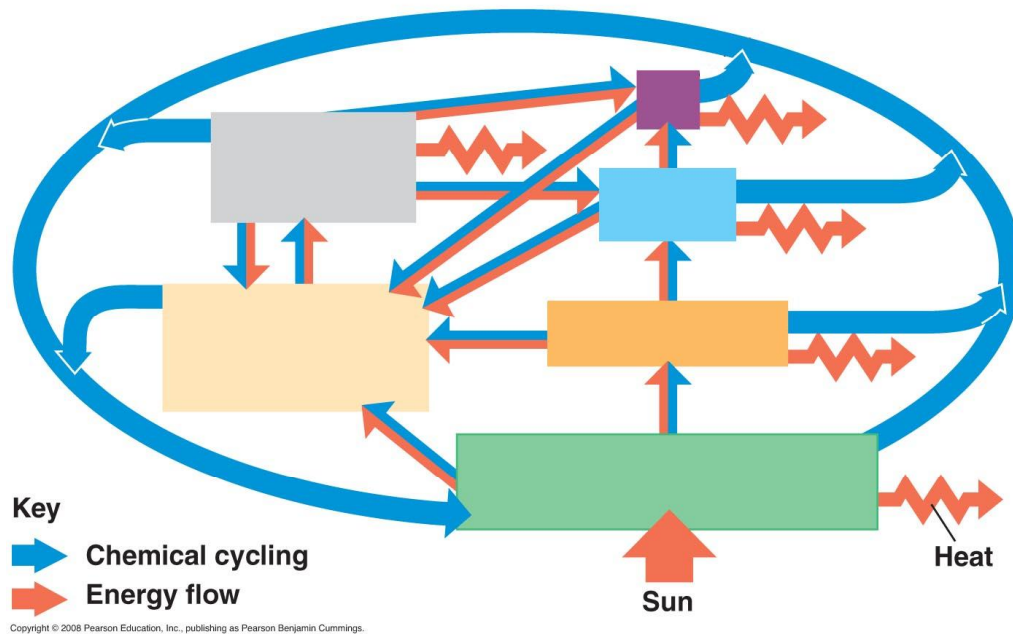
18. In Figure 2 it is states that in the early stages of succession, the principle community that dominates is the pioneer species. What would the pioneer species be for this example of succession?
- What type of “Life History” characteristics would this species exhibit?
 - Draw a survivorship curve that might represent this species.

19. Interdependence in nature is illustrated by the transfer of energy through trophic levels. The diagram below depicts the transfer of energy in a food web of an Arctic lake located in Alaska.

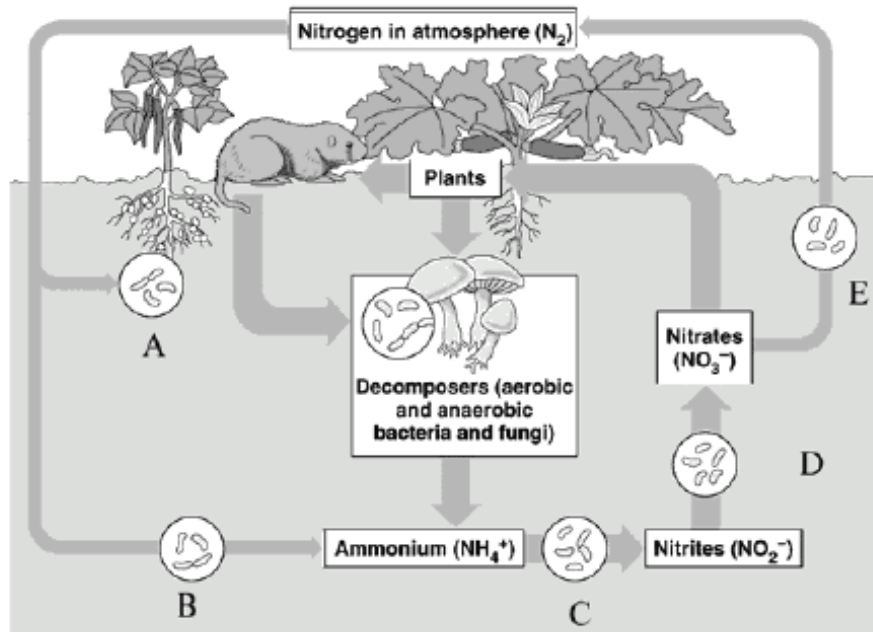


- Choosing organisms from four different trophic levels of this food web as examples, explain how energy is obtained at each trophic level.
- Describe the efficiency of energy transfer between trophic levels of this food web as examples, explain how the amount of energy available at each trophic level affects the structure of the ecosystem.
- If the cells in the dead terrestrial plant material that washed into the lake contained a commercially produced toxin, what would be the likely effects of this toxin on this food web? Explain.

20. Fill in the figure below with the following trophic levels: producers, primary consumer, secondary consumer, tertiary consumer, detritivores, detritus

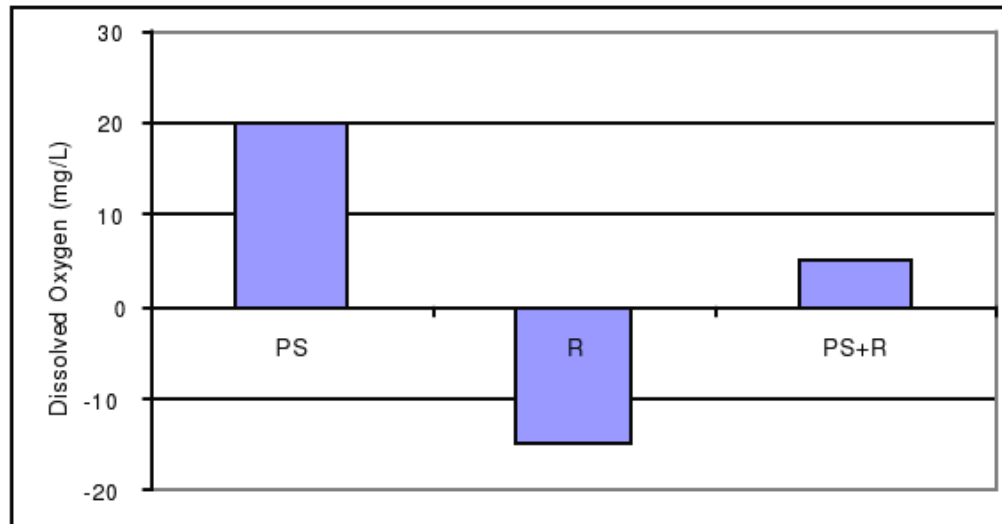


21. The figure below shows the nitrogen cycle. Complete the table below according to the information provided.



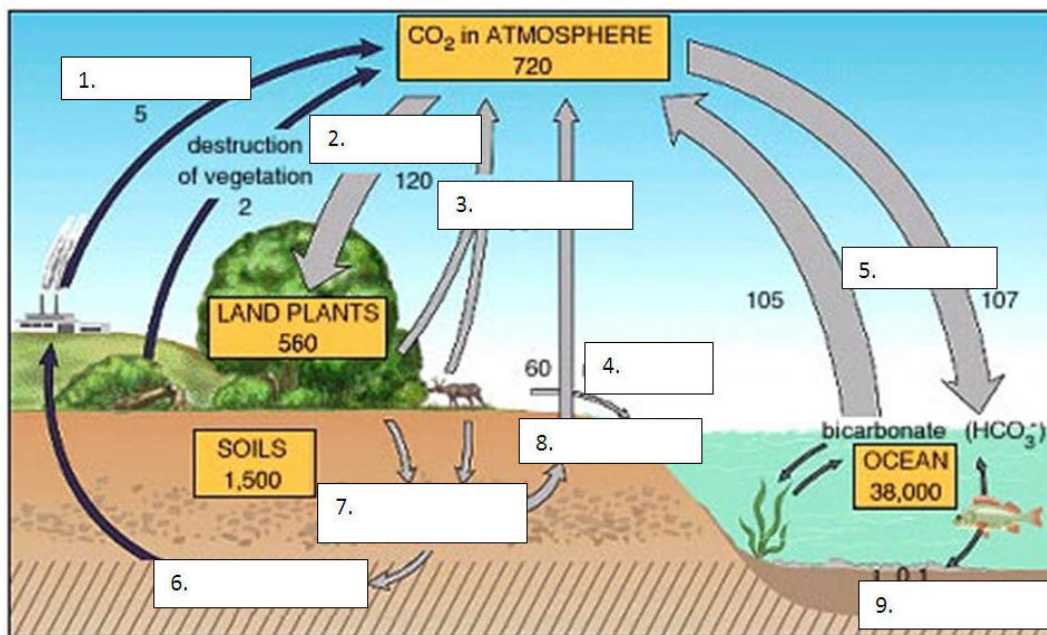
Bacteria...	Answer: A through E (there could be more than one correct answer!)
1. Able to form root nodules with plants	
2. Able to denitrify	
3. Able to nitrify	
4. Able to use ammonium as a energy source	
5. Able to fix nitrogen from the air	

22. The graph shows the productivity of an aquatic ecosystem measured in terms of dissolved oxygen produced and consumed by green plants and photosynthetic algae where PS = photosynthesis and R = respiration.



- Which bar represents net primary productivity? Explain.
- An algal bloom occurs until nutrient levels are exhausted. Then the algae die off and microbial decomposition begins. What will happen during the algal bloom?
- What will happen to the dissolved oxygen during the microbial decomposition?

23. Place the proper labels on the diagram of the carbon cycle.



- How has human intervention altered this cycle?
- What are some of the consequences of these alterations? BE SPECIFIC!!!!!!