

My Favorite Outdoor Spot

1. Think of your favorite outdoor spot. It can be either a terrestrial or aquatic habitat. Describe your favorite spot in complete detail. Be sure to include both the living and nonliving factors of your spot. (Write this in your b/w comp book: reading and writing log)
2. Create a poster/picture that reflects your written description.
 - a) Label the abiotic components.
 - b) Label the biotic components.
 - c) Include a food chain (3-5 organisms) and label the autotroph and heterotroph.
 - d) Show a human disruption and identify/diagram its consequences.
 - e) Create a title that identifies your spot and tells whether it is terrestrial or aquatic.
 - f) paste the rubric on the back - check to make sure that all components are found on your poster to earn the full amount of points.

Name: _____ Period: _____

Component	Colorful Poster is very colorful	Title Title indicates favorite spot and either the name of aquatic or terrestrial	Abiotic factors + 4 abiotic factors are labeled	Biotic factors + 4 biotic factors are clearly labeled	Food chain The food chain diagramed and is labeled	Human disruption Human disruption is appropriate and somewhat diagramed
2	Poster is somewhat colorful	Title is missing either the name of aquatic or weather its terrestrial	3-2 abiotic factors are labeled	3-2 biotic factors are clearly labeled	Food chain may be diagramed, but not available or not labeled	Human disruption is not appropriate and somewhat diagramed or is not diagramed
1	Poster is in pencil or pen, but not colorful	Title is not available or illegible	no abiotic factors are labeled	no biotic factors are labeled	Food chain is not available or not diagramed	Human disruption is not appropriate and realistic
0	Poster is completed in pencil or pen, but not colorful	Title is not available or illegible	no abiotic factors are labeled	no biotic factors are labeled	Food chain is not available or not diagramed	Human disruption is not appropriate and realistic

Total = _____ / 24

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Total = _____ / 24



CHAPTER 19 TEST

INTRODUCTION TO ECOLOGY

MATCHING Write the correct letter in the blank before each numbered term.

- 1. community a. where an organism lives
- 2. generalist b. phenomenon that insulates Earth from the freezing temperature of space
- 3. ecology c. members of a single species living in one place at one time
- 4. resources d. organisms interacting in a specific area
- 5. habitat e. increase in average global temperature due to trapped excess greenhouse gases
- 6. population f. a species with a broad niche
- 7. greenhouse effect g. study of the interactions between organisms and their environment
- 8. global warming h. energy and materials needed by a species

TRUE-FALSE If a statement is true, write *T* in the blank. If a statement is false, write *F* in the blank, and then in the space provided, explain why the statement is false.

- 9. The world's population tripled from 2 billion to 6 billion people in just 66 years. _____
- 10. The greenhouse effect is a phenomenon caused by excess fossil fuels being burned. _____
- 11. A tolerance curve shows the range of a certain environmental factor that a species can tolerate and the optimal range for that factor. _____
- 12. Regulators change their internal conditions as their environment changes. _____
- 13. The realized niche of a species is the range of resources it actually uses. _____

MULTIPLE CHOICE Write the letter of the most correct answer in the blank.



- 14. Which of the figures above depicts a conformer? _____
 a. A b. B c. C d. D
- 15. The small percentage of ultraviolet radiation that strikes the Earth from the sun is the cause of _____
 a. climate changes. c. global warming.
 b. sunburns and skin cancer. d. the greenhouse effect.
- 16. The broadest, most inclusive level of organization in ecology is _____
 a. an ecosystem. b. a community. c. a population. d. the biosphere.
- 17. When organisms affect and are affected by other organisms in their surroundings and with the nonliving parts of their environment, it is called _____
 a. ecology. c. interdependence.
 b. disturbances of the ecosystem. d. modeling.
- 18. An example of an abiotic factor is _____
 a. tree. b. sunlight. c. bird. d. grass.
- 19. Some organisms adjust their tolerance to abiotic factors through _____
 a. adaptation. b. acclimation. c. application. d. resources.
- 20. Conformers are organisms that _____
 a. use energy to control internal conditions. c. do not regulate internal conditions.
 b. change over many generations. d. None of the above
- 21. A long term strategy to avoid unfavorable conditions by moving to another, more favorable habitat is called _____
 a. dormancy. b. migration. c. hibernation. d. All of the above

Name _____ Class _____ Date _____

27. Describe some of the characteristics of a country whose population is growing rapidly.
28. Describe some of the characteristics of a country whose population is growing slowly or is stable.
29. What type of survivorship curve is characteristic of species in which most individuals live close to the full life expectancy? _____
- What type of survivorship curve is characteristic of species in which most individuals die at a very young age? _____
- What type of survivorship curve is characteristic of species in which individuals die at a relatively constant rate throughout their life expectancy? _____

DRAWING CONCLUSIONS Follow the directions given below.

30. Population size is sometimes estimated by sampling a part of the population. The mark-and-recapture method is widely used in estimating the size of animal populations. In this technique, individuals are removed at random from the population, marked, and returned to the population. After a fixed time, another sample is taken (recaptured). An estimate of the total population is then obtained by calculating the ratio of the total number of marked individuals to the number of unmarked individuals counted in the second sample. Use the equation below to find an estimate of a population size by solving for N , where T = number marked in first capture, t = number of marked animals recaptured, n = total animals recaptured, and N = estimate of the total population.

$$\frac{T}{N} = \frac{t}{n}$$

- a. Six ferrets were removed from an abandoned prairie dog town, marked with radio collars, and returned. Two weeks later, 12 ferrets were recaptured. Three wore collars. Estimate the size of the population of ferrets in this area.
- b. In a second recapture, 12 ferrets were recaptured and six had collars. Estimate the size of the population. Compare this with your original estimate.
- c. If no ferrets with collars are recaptured, can you estimate the size of the total population? Why or why not?

Name _____ Class _____ Date _____

20. The graph of the age structure of a population shown on the previous page represents
- the birth and death rates of the population.
 - the life expectancy of the population.
 - the likelihood of an individual surviving to an old age.
 - the percentage of people in each age class.
21. In the exponential model of population growth, the birth rate
- increases while the death rate remains constant.
 - remains constant while the death rate decreases.
 - and the death rate remain constant.
 - and the death rate increase.
22. How did the agricultural revolution promote human population growth?
- It improved economic conditions for many people.
 - It improved the availability and stability of food supplies.
 - It enabled people to move to new areas and establish new sites for population growth.
 - It increased the general level of health of most people of the world.

23. Beginning about 1650, the global human population

- had a low birth rate and a high death rate.
- reached the Earth's carrying capacity.
- began to grow exponentially.
- had a birth rate equal to the death rate.

SHORT ANSWER Answer the questions in the space provided.

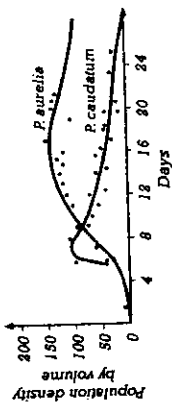
24. How can a population appear to be evenly distributed when it is viewed up close but clumped in its distribution when viewed from far away? _____
25. What is the difference between density-independent limiting factors and density-dependent limiting factors? Provide an example of each. _____
26. The global human population growth rate increased dramatically after World War II. What component of the following equation for determining growth rate changed in order for this to occur? birth rate - death rate + growth rate _____

Name _____ Class _____ Date _____

MULTIPLE CHOICE Write the letter of the most correct answer in the blank.

14. Which of the following is an example of mimicry?
 - a. heat-sensitive pits of rattlesnakes
 - b. leaflike coloration of a mantis
 - c. bright coloration of certain frogs
 - d. colored rings of a coral snake
15. Which of the following is *not* an example of a predator's adaptation for finding prey?
 - a. spiders' webs that trap flying insects
 - b. stripes on a tiger's coat that blend with the grassland habitat of small animals
 - c. stripes on a nonpredatory wasp that resemble the stripes of a predatory wasp
 - d. rattlesnakes' heat-sensitive pits that detect warm-bodied prey
16. Which of the pairs of parasites listed below are endoparasites?
 - a. tapeworms and leeches
 - b. malarial parasites and tapeworms
 - c. leeches and fleas
 - d. ticks and mosquitoes
17. Competition is most intense between closely related species that
 - a. are similar in appearance.
 - b. have different beak sizes.
 - c. use the same resources.
 - d. use different resources.
18. Which of the following is *not* a hypothesis that helps to explain the greater species richness that occurs at tropical latitudes than at latitudes farther from the tropics?
 - a. Plants can photosynthesize all year creating more energy reserves.
 - b. Tropical habitats are the oldest on Earth and have not been disturbed by the ice ages.
 - c. Tropical habitats have stable climates, so species have diversified more in these areas.
 - d. There is less competition for resources among species in the tropics.
19. The longest-held hypothesis to explain the relationship between species richness and community stability states that communities with more species
 - a. contain more links between species and thus can withstand greater disturbance.
 - b. inhabit large land areas, which are always richer in species than small land areas.
 - c. recover more quickly from environmental disturbances.
 - d. can evolve more new species than communities with fewer species.
20. Pioneer species
 - a. disperse many seeds over a large area.
 - b. are usually fast-growing.
 - c. are usually small plants.
 - d. All of the above

Paramecia Interactions



21. The graph below illustrates
 - a. commensalism.
 - b. competitive exclusion.
 - c. a predator-prey relationship.
 - d. resource partitioning.

Name _____ Class _____ Date _____

CHAPTER 21 TEST

COMMUNITY ECOLOGY

MATCHING Write the correct letter in the blank space before each numbered term.

1. mutualism
2. species richness
3. parasitism
4. secondary succession
5. commensalism
6. primary succession
7. predation
8. species diversity
9. A harmless species that is a mimic of a dangerous species is preyed upon, while the dangerous species is avoided.
10. Tapeworms are such highly adapted parasites that they do not have a digestive system.
11. Larger land areas usually include a greater diversity of climates than smaller land areas and can therefore support more species.
12. If a predatory species were removed from an environment, its prey species could dominate the environment.
13. Grasses are common pioneer species because they secrete acids that dissolve rock, releasing minerals for plant growth.

TRUE-FALSE If a statement is true, write *T* in the blank. If a statement is false, write *F* in the blank, and then in the space provided, explain why the statement is false.

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Name _____ Class _____ Date _____

29. The tables below list the tree species and the number of individuals of each species in two plots of land. Which plot has greater species richness? Which plot has greater species diversity?

PLOT 1			PLOT 2		
Species	Number		Species	Number	
Yellow poplar	102		Yellow poplar	99	
Sassafras	60		Cucumber magnolia	143	
Cucumber magnolia	46		Red maple	113	
Red maple	42		Red oak	102	
Red oak	23		Butternut	97	
Butternut	9		American beech	75	
Shagbark hickory	5				
American beech	2				

DRAWING CONCLUSIONS Follow the directions given below.

30. In desert regions of the southwestern United States, some species of ants and rodents eat seeds produced by desert plants. Many seeds are consumed by both animals. An experiment was conducted to determine the effects of ants and rodents on seed numbers in the wild. In this experiment, (1) only ants were removed from some plots of land, (2) only rodents were removed from some plots, (3) both ants and rodents were removed from some plots, or (4) both ants and rodents were allowed to remain on some plots. After a period of time, data were collected from the plots. These data are presented in the table below.

	Only ants removed	Only rodents removed	Ants and rodents removed	Ants and rodents remain
Number of ant colonies	0	547	0	313
Number of rodents	176	0	0	123
Number of seeds per square meter	356	375	1,527	362

- Which plots were the control plots in this experiment?
- What happened to the seed density in plots in which either ants or rodents were removed?
- What happened to the seed density in plots in which both ants and rodents were removed?

Name _____ Class _____ Date _____

22. Species richness in grasses was found to improve a community's stability. Which of the following results led to this conclusion?

- Species-rich grass plots that were subjected to freezing temperatures lost less plant mass and took less time to recover than grass plots with fewer species.
- Species-rich grass plots that were subjected to drought lost less plant mass and took less time to recover than grass plots with fewer species.
- Species-rich grass plots that were subjected to human habitat destruction lost fewer plants than grass plots with fewer species.
- All of the above.

23. In the process of succession, _____

- an unchanging climax community is the final stage.
- organisms change the environment so that it can support the growth of other species.
- progress toward a climax community cannot be altered by further disturbances.
- grasses are present in primary succession but absent in secondary succession.

SHORT ANSWER Answer the questions in the space provided.

24. What are the adaptive advantages of thorns, tough leaves, and toxins to plants?

25. Explain why a species of barnacles, *Semibalanus balanoides*, is dominant in areas that are usually under water and another species, *Chthamalus stellatus*, is dominant in areas that have prolonged dry periods.

26. What kind of relationship is illustrated by cattle egrets and Cape buffalo? What kind of relationship is illustrated by certain flowers and nectar-feeding bats?

27. How are humans causing a decrease in species richness in certain environments?

28. Describe the environmental conditions present during succession in Glacier Bay, Alaska.

MULTIPLE CHOICE Write the letter of the most correct answer in the blank.

14. Organisms that obtain energy by making their own organic molecules are called
 - a. consumers.
 - b. herbivores.
 - c. producers.
 - d. decomposers.
15. The highest net primary productivity is found in
 - a. lakes and temperate grasslands.
 - b. estuaries and tropical rain forests.
 - c. savannas.
 - d. the open ocean.
16. Food chains differ from food webs in that food chains
 - a. include more organisms than do food webs.
 - b. include producers and consumers, while food webs include only consumers.
 - c. depict only one line of energy transfer, while food webs depict many interrelated food chains.
 - d. depict only one line of energy transfer to a top consumer, while food webs depict all possible lines of energy transfer to a top consumer.
17. Which of the following best characterizes the differences between tundra and taiga biomes?
 - a. Tundra biomes are located at lower latitudes than taiga biomes.
 - b. Tundra biomes are warmer and have lower average annual precipitation than taiga biomes.
 - c. Tundra has small, slow-growing plants with root systems limited by a layer of permafrost, while taiga has trees adapted to cold temperatures.
 - d. Tundra has extremely long and cold winters, and taiga has short and warm winters.
18. Temperate deciduous forests are characterized by
 - a. pronounced seasons with high average annual precipitation.
 - b. the presence of trees that lose their leaves during the winter.
 - c. mild winters, moderate average annual precipitation, and broad-leaved trees.
 - d. pronounced seasons, broad-leaved trees, and grasses being the dominant plants.
19. Which of the following is *not* a water-conservation adaptation found in at least some desert organisms?
 - a. mechanisms that enable water storage
 - b. mechanisms that reduce water loss
 - c. mechanisms that increase activities during the day
 - d. mechanisms that reduce heat loss during the day
20. The photic zones of the oceans differ from the aphotic zones in that
 - a. there are living things in the photic zones but no living things in the aphotic zones.
 - b. the photic zones are warmer than the aphotic zones.
 - c. the photic zones are found near the tropics, while the aphotic zones are found far from the tropics.
 - d. the photic zones receive sunlight, while the aphotic zones do not.
21. The most productive zone in the oceans is the
 - a. neritic zone.
 - b. intertidal zone.
 - c. pelagic zone.
 - d. benthic zone.

CHAPTER 22 TEST

ECOSYSTEMS AND THE BIOSPHERE

MATCHING Write the correct letter in the blank space before each numbered term.

1. nitrification
 - a. area rich in wildlife having two seasons—wet and dry
 - b. nitrates converted into nitrogen gas
 - c. deep water in the open ocean
 - d. eat other consumers
 - e. ammonia converted into nitrates and nitrites
 - f. areas with low rainfall, rich soil, and grasses
 - g. obtain nutrients from dead organisms
 - h. ocean over a continental shelf
2. decomposers
3. neritic zone
4. denitrification
5. temperate grasslands
6. carnivores
7. oceanic zone
8. savannas

TRUE-FALSE If a statement is true, write *T* in the space provided. If a statement is false, write *F* in the blank, and then in the space provided, explain why the statement is false.

9. Decomposers break down living organisms and thus help prevent population explosions of species. _____
10. During a biogeochemical cycle, water, minerals, or carbon dioxide moves from the abiotic portion of the environment into living things and back again. _____
11. Carbon moves from the biotic portion of its cycle into the abiotic portion during photosynthesis. _____
12. Deserts differ from other biomes in that they have high temperatures all year. _____
13. Estuaries are areas of shallow water where fresh water flows into the sea. _____

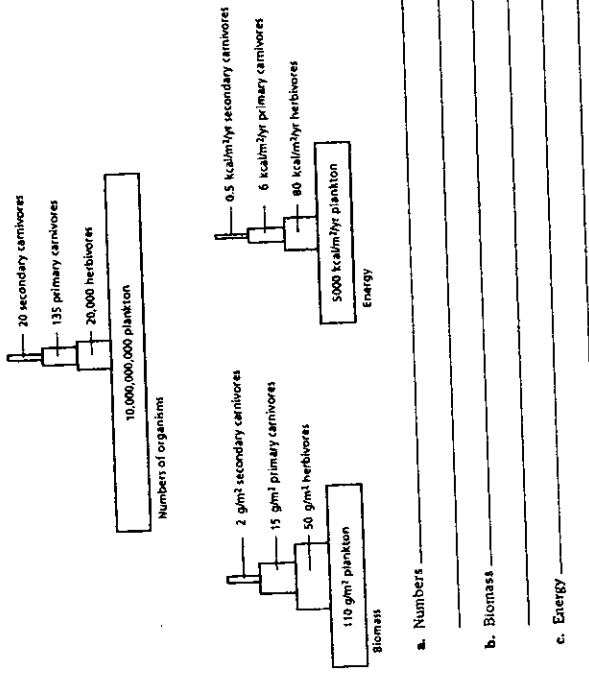
Name _____ Class _____ Date _____

28. What are the distinguishing characteristics of a tropical rain forest, and how do they differ from those of temperate deciduous forests?

29. Lakes and ponds can be divided into two categories. What are these categories, and how do they differ from each other?

DRAWING CONCLUSIONS

30. The pyramids shown below depict the numbers of organisms, the biomass, and the energy at different trophic levels in an aquatic ecosystem. In the spaces labeled a-c below, analyze and describe each pyramid. Explain why each measured parameter results in the same general shape.



Name _____ Class _____ Date _____

21. Omnivores eat
 a. only producers.
 b. only consumers.
 c. producers and consumers.
 d. only other omnivores.

22. Animals that live in savannas
 a. must deal with long periods of drought.
 b. must be able to survive cold temperatures.
 c. are primarily carnivores.
 d. are primarily omnivores.

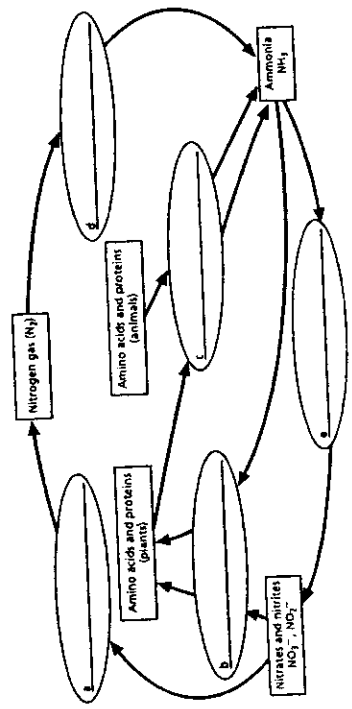
SHORT ANSWER Answer each question in the space provided.

24. What is a trophic level, and what determines an organism's trophic level?

25. Why is so little of the energy from one trophic level transferred up to the next trophic level?

26. During which process(es) in the carbon cycle is carbon converted from an inorganic form into an organic form?

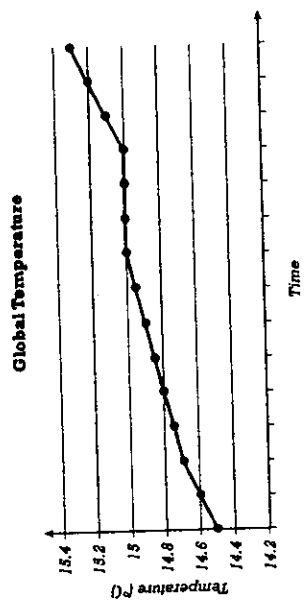
27. The diagram below illustrates the nitrogen cycle. Label each arrow with the process it represents.



Name _____ Class _____ Date _____

MULTIPLE CHOICE Write the letter of the most correct answer in the blank.

- 14. Convection cells
 - a. cause ozone from the lower atmosphere to move into the upper atmosphere.
 - b. affect other convection cells around the world and therefore affect climate worldwide.
 - c. circulate carbon dioxide generated at the surface of the Earth and therefore induce global warming.
 - d. mix warm air with cool air, thereby stabilizing air temperatures worldwide.
- 15. El Niños have resulted in
 - a. decreased anchovy exports in Peru.
 - b. reduced grain production in Australia.
 - c. fewer forest fires in the southeastern United States.
 - d. All of the above
- 16. Many scientists think that humans have caused an increase in the size of the ozone hole by
 - a. burning large quantities of fossil fuels.
 - b. generating a lot of carbon dioxide that has resulted in an increase in the atmospheric carbon dioxide level.
 - c. releasing large quantities of chlorofluorocarbons into the atmosphere.
 - d. All of the above
- 17. Which of the following measures of biodiversity takes into consideration the number of species present at a site as well as the number of individuals of each species?
 - a. species evenness
 - b. species richness
 - c. species diversity
 - d. all of the above
- 18. The graph below depicts changes in global temperature over a period of time. What time period is represented in this graph?
 - a. the past 500 years
 - b. the time since the last ice age
 - c. from 1900 to the present
 - d. the next 200 years



Name _____ Class _____ Date _____

CHAPTER 23 TEST

ENVIRONMENTAL SCIENCE

MATCHING Write the correct letter in the blank space before each numbered term.

- 1. chlorofluorocarbon _____ a. identification and maintenance of natural areas
- 2. biodiversity _____ b. migratory bird routes
- 3. flyways _____ c. destroys ozone
- 4. genetic diversity _____ d. the variety of organisms at a site
- 5. El Niño _____ e. the reversal of damage to natural areas
- 6. restoration biology _____ f. increases carbon dioxide levels
- 7. conservation biology _____ g. amount of genetic variation at a site
- 8. fossil-fuel burning _____ h. occasional warm-water current in the Pacific

TRUE-FALSE If a statement is true, write T in the blank. If a statement is false, write F in the blank, and then in the space provided, explain why the statement is false.

- 9. Ozone in the upper atmosphere screens out much of the sun's ultraviolet radiation. _____
- 10. Increased levels of carbon dioxide in the atmosphere have not caused an increase in global temperatures. _____
- 11. Most of the organisms that are alive today have been described and classified. _____
- 12. Mammals make up a small percentage of the total number of species on Earth today. _____
- 13. The common practice of providing food for migratory birds at intervals along their flyways helps to conserve these birds. _____

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Name _____ Class _____ Date _____

27. Which of Earth's biomes has the greatest biodiversity and is therefore most critical to preserve in order to maintain Earth's biodiversity? _____

28. Describe the origins and strategies of debt-for-nature swap and ecotourism. _____

29. What are the expected effects of reintroducing the gray wolf to Yellowstone National Park? _____

Name _____ Class _____ Date _____

19. Which of the following has significantly reduced biodiversity on Earth?
 a. mining for fossil fuels
 b. agriculture
 c. air and water pollution
 d. wars

20. Conserving the biodiversity of plants for the possibility of discovering plants with medicinal use involves placing _____ on biodiversity.
 a. utilitarian value
 b. debt-for-nature swap value
 c. nonutilitarian value
 d. ecotourism value

21. Migratory birds are particularly vulnerable to extinction because
 a. they are aquatic birds, and water availability in aquatic habitats varies over time.
 b. they are prey to many predators along their flyways.
 c. they are typically small birds and often don't survive their migrations.
 d. they require a critical habitat at intervals along their migratory route as well as at their destinations.

22. The Florida Everglades is an unusual ecosystem in that
 a. a major component of it is a large, slow-moving river that is linked to other water bodies in the region.
 b. the inland water systems are composed of salt water.
 c. it is home to many species of water birds.
 d. it is mainly swampland dominated by grasses.

23. Which of the following is *not* a part of the plan to restore the Everglades?
 a. elimination of some of the drainage canals that were built to drain water from the region
 b. removal of melaleuca trees
 c. designation of some of the birds as endangered species
 d. purchase of additional land for park protection

SHORT ANSWER Answer each question in the space provided.

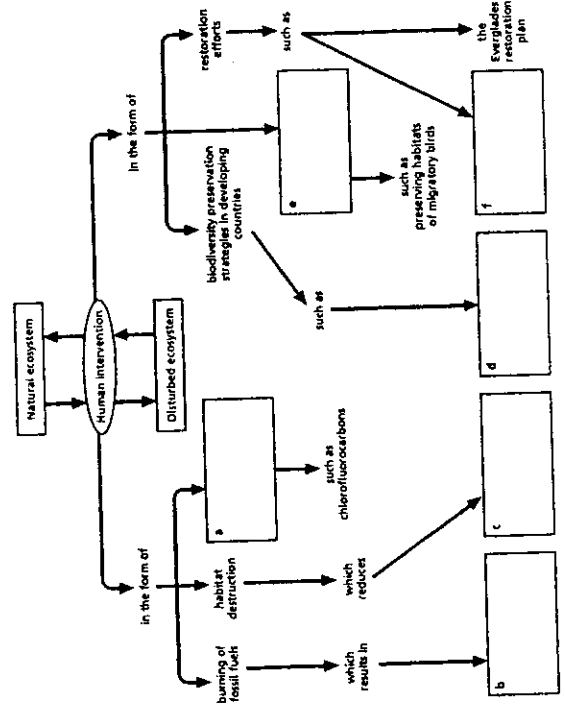
24. How do convection cells affect climates all over the world? _____

25. What effects might a decrease in the ozone layer have on humans and other organisms? _____

26. How are upper atmospheric ozone levels, atmospheric carbon dioxide levels, global temperature, undeveloped land areas, and various natural resources expected to be affected by continued increases in the Earth's human population? _____

DRAWING CONCLUSIONS

30. Examine the flowchart below that depicts some effects of human intervention on Earth's ecosystems. Complete the flowchart by writing appropriate responses in spaces a-f.



Chapter 23 Test

The Web of Life: Predator to Prey

Study Questions

- 1) Define a biome.
- 2) The physical environment of a biome does not determine the living environment. True or False?
- 3) List two of the factors that affect the physical environment.
- 4) The living part of a biome is called a _____.
- 5) Name one of the animals found in a temperate rain forest.
- 6) List the four basic requirements for life.
- ~~7) Geography plays a critical role in the solar energy, nutrients, and water available in a biome. True or False?~~
- 8) The availability of important nutrients in an ecosystem are the result of _____ that occur in the environment.
- 9) Why is carbon important to living organisms?
- 10) Carbon is returned to the atmosphere in the form of _____.
- 11) Name two fossil fuels.
- 12) The excessive release of carbon-dioxide is believed to cause the _____.
- 13) What nutrient is critical to plants and animals?
- 14) The atmosphere is made up of about _____% nitrogen gas.
- ~~15) What must nitrogen be converted into before plants can use it?~~
- 16) Grazing animals obtain _____ and _____ from plants.
- 17) Name one way nitrates are produced.
- 18) _____ is a critical component of the molecules that compose living organisms and makes up the bones and teeth of vertebrates.
- 19) Phosphates are found in the atmosphere. True or False.
- 20) Phosphates are responsible for the rapid overgrowth of algae, causing the death of surrounding aquatic organisms in a process known as _____.
- 21) The energy that powers the earth's ecosystems is provided by the _____.

- 22) Plants are also called _____ because they _____ the chemical energy necessary for all other life through photosynthesis.
- 23) There are always more animal consumers in a biome than plant producers. True or False?
- 24) Only about _____% of the energy supplied by plants is used by primary consumers—animals that obtain their energy directly from plants.
- 25) Discuss why only a limited number of sharks may exist in an ecosystem.
- 26) Humans, bears, and raccoons are good example of _____ because they eat both plants and animals.
- 27) Give an example of a decomposer.
- 28) Decomposers are not very important to life on earth. True or False?
- 29) Describe a habitat.
- 30) An organism's role in an ecosystem could also be described as it's _____.
- 31) List the three major types of relationships that occur within a community.
- 32) What is one of the reasons that no two species occupy the same role in a community? What would happen if this were to occur?
- 33) Describe briefly the process of co-evolution.
- 34) Give two examples of co-evolution.
- 35) _____ developed as some non-poisonous animals came to resemble poisonous ones. Give one example.
- 36) Some animals use chemicals as a defense. True or False?
- ~~37) Define a symbiotic relationship. Give an example.~~
- 38) There are three types of symbiotic relationships:
1) _____, 2) _____, and 3) _____.
- 39) Give three examples of a parasite.
- 40) _____ occurs when two organisms interact in a way that is beneficial to both.
- 41) The populations of predators and prey rise and fall in _____.
- 42) There is no natural limit to the growth of species populations. True or False?
- 43) Name one species that appears to have no natural limit to its growth.