Q1W2-Bio-G10- Qs Bank

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Ecology is the study of relationships among —
a. living things only.
b. living and nonliving things.
c. nonliving things only.
d. None of the above

____ 2. The portion of Earth that supports the existence of living things is called the —
a. ecosystem.
b. habitat.
c. biosphere.
d. niche.

____ 3. Which of the following is a biotic factor that might affect the life of a water-dwelling organism?
a. Temperature of the water
b. Speed of water current
c. Pollutants in water
d. Bacterial population in water

____ 4. Which level of organization encompasses all of the others?
a. Ecosystem
b. Community
c. Population
d. Division

____ 5. Which of the following is NOT consumed by fungal decomposers?
a. First-order heterotrophs
b. Third-order heterotrophs
c. Producers
d. None of the above

____ 6. Which ecological pyramid best explains why food chains are typically only three or four links long?
a. Pyramid of biomass
b. Pyramid of energy
c. Pyramid of numbers
d. None of the above

____ 7. How does the amount of water on Earth change as a result of the water cycle?
a. It always increases
b. It alternately increases and decreases
c. It remains constant
d. It always decreases

____ 8. In the carbon cycle, in what form are carbon atoms generally returned to the atmosphere?
a. Simple sugars
b. Carbon monoxide
c. Methane
d. Carbon dioxide

____ 9. Which of the following things does NOT allow plants to obtain atmospheric nitrogen in a more usable form?
a. Photosynthesis
b. Lightning
c. Symbiotic bacteria
d. Chemical fertilizers

____ 10. Water is lost to the abiotic parts of the biosphere from the biotic parts by the process of _____.
a. precipitation
b. photosynthesis
c. transpiration
d. infiltration

____ 11. Nitrogen is released to the abiotic parts of the biosphere from the processes of death and _____.
a. decay by bacteria
b. infiltration of groundwater
c. runoff
d. lightning in storm clouds

____ 12. Carbon dioxide in the atmosphere enters the biotic parts of the biosphere through _____.
a. burning of forests
b. photosynthesis
c. combustion of fossil fuels
d. all of these

____ 13. Some birds are known as honey guides because they may be followed by humans to wild beehives. When the humans take honey from the hives, the birds are able to feast on the honey and bees, too. This type of relationship can <u>best</u> be described as _____.
a. parasitism
b. commensalism
c. mutualism
d. symbiosis

____ 14. Sea stars live in saltwater ecosystems. Some species live in shallow tidal pools, while others live in the deepest parts of the oceans. This is a description of the _____ of sea stars.

a. habitat
b. community
c. niche
d. none of these

____ 15. Cougars are predators that often eat weakened or diseased animals. This is a description of the _____ of cougars.
a. habitat
b. community
c. niche
d. none of these

____ 16. An ecologist who studies how several species in an area interact among each other and with the abiotic parts of the environment is interested in the biological organization level called a(n) _____.
a. organism
b. population
c. community
d. ecosystem

____ 17. An ecologist who studies how several species in an area interact is interested in the biological organization called a(n) _____.
a. organism
b. population
c. community
d. ecosystem

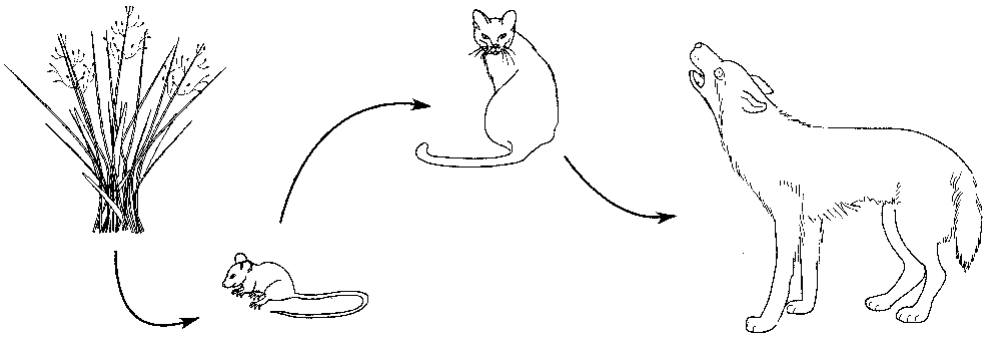

Figure 2-1

____ 18. Referring to Figure 2-1, suppose 10 000 units of energy are available at the level of the grasses. What is the total number of energy units lost by the time energy reaches the coyote?
a. 90 units
b. 990 units
c. 9900 units
d. 9990 units

____ 19. Referring to Figure 2-1, as matter and energy move from grasses to coyotes, the amount of available energy _____.
a. increases
b. decreases
c. decreases then increases
d. increases or decreases but population size remains the same

____ 20. Referring to Figure 2-1, the relationship between cats and mice could best be described as _____.
a. predator-prey
b. scavenger-carrion
c. parasite-host
d. consumer-producer

____ 21. Referring to Figure 2-1, the coyotes would be considered _____.
a. herbivores
b. third-order consumers
c. second-order consumers
d. decomposers

____ 22. Referring to Figure 2-1, energy flows from _____.
a. coyotes to grasses
b. cats to mice
c. mice to cats
d. coyotes to cats

____ 23. Where is the biosphere in Figure 2-4?

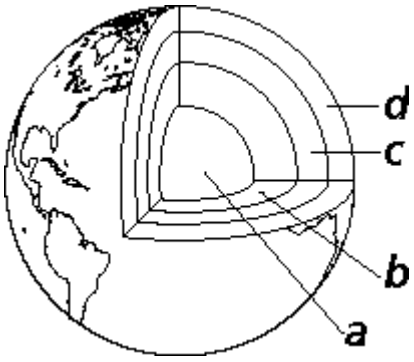

Figure 2-4

a. core
b. mantle
c. upper mantle
d. earth's crust

____ 24. Identify the abiotic factor labeled in the ecosystem shown in Figure 2-5.

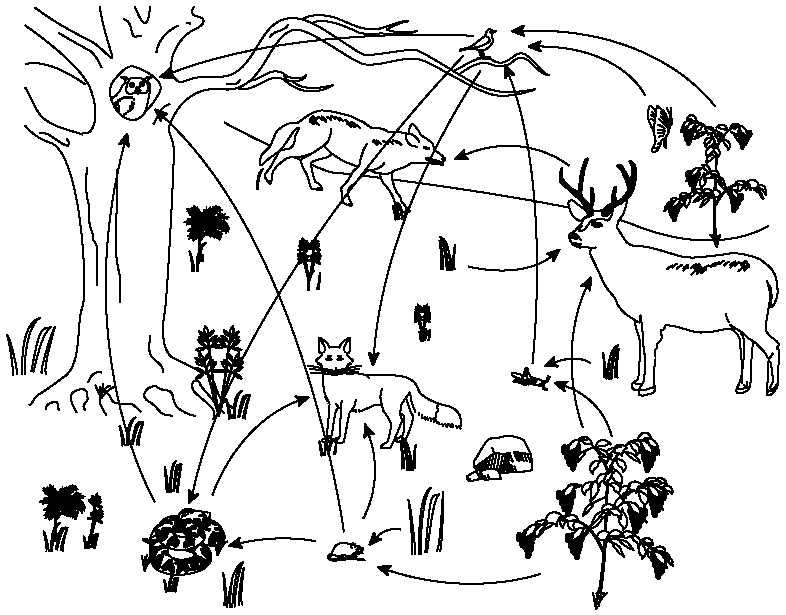

Figure 2-5

a. mouse
b. butterfly
c. rock
d. tree

____ 25. The group of animals in Figure 2-6 is an example of what?

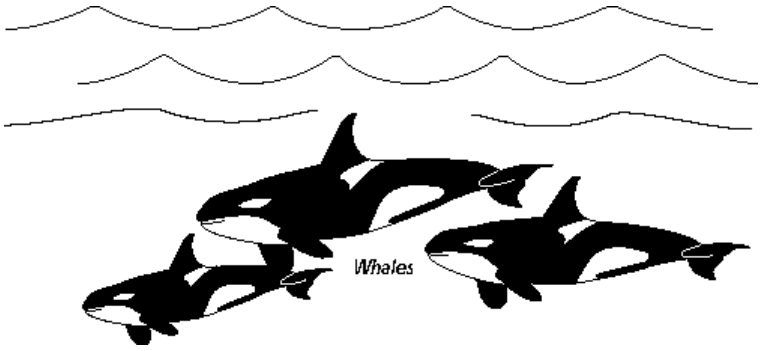

Figure 2-6

a. community
b. ecosystem
c. population
d. biosphere

____ 26. In the energy pyramid shown in Figure 2-7, which level has the smallest number of organisms?

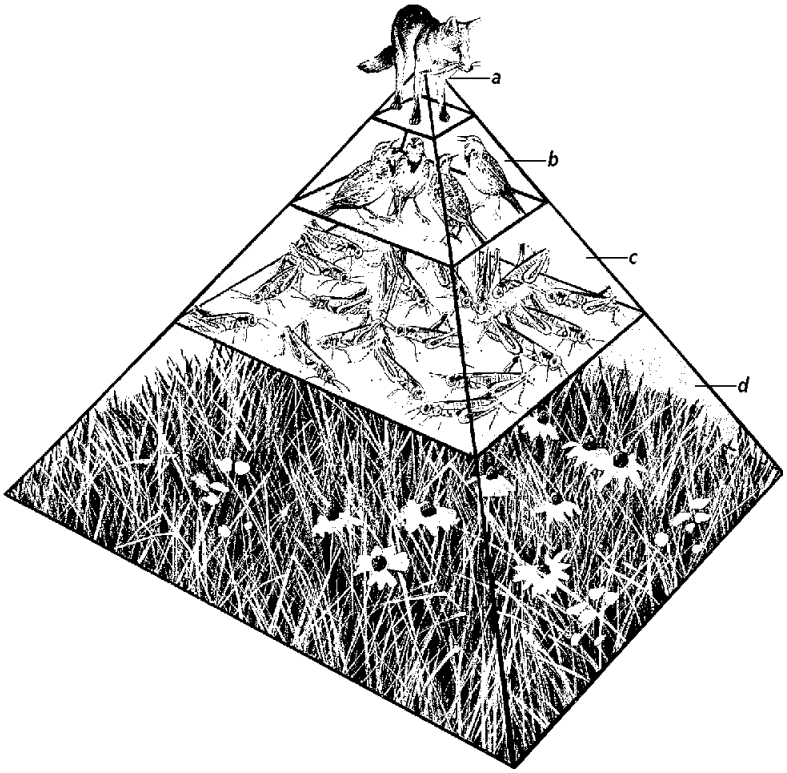

Figure 2-7

a. fox
b. birds
c. grasshoppers
d. grass

____ 27. The organisms growing on the log in Figure 2-8 are ____?

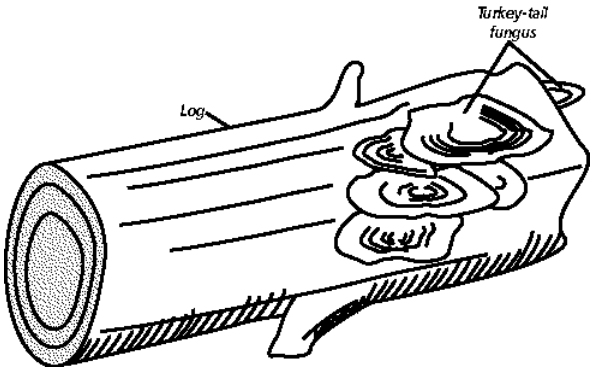

Figure 2-8

a. producers
b. autotrophs
c. carnivores
d. decomposers

____ 28. Which organism shown in the pyramid shown in Figure 2-9 receives the highest percentage of energy from the sun?

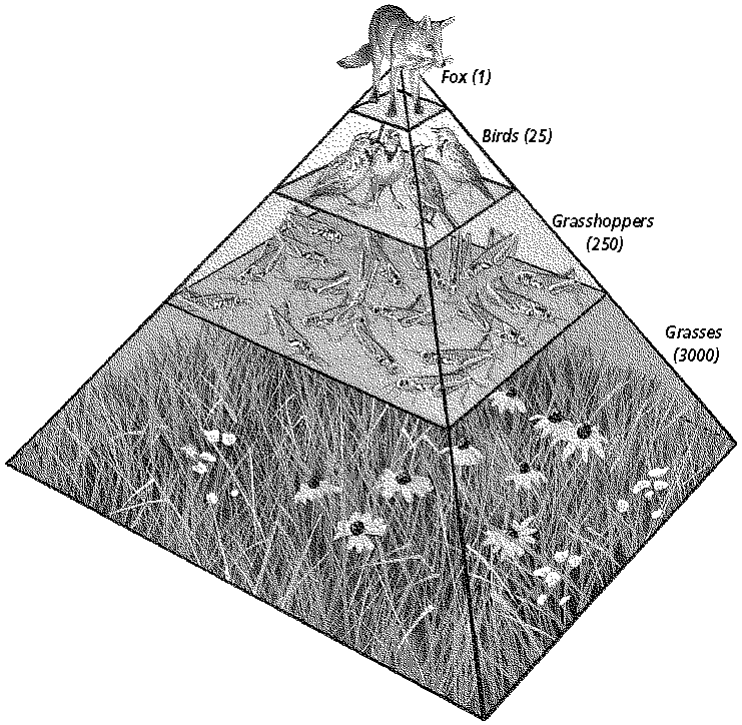

Figure 2-9

a. fox
b. birds
c. grasshoppers
d. grass

____ 29. What type of cycle is depicted in Figure 2-10?

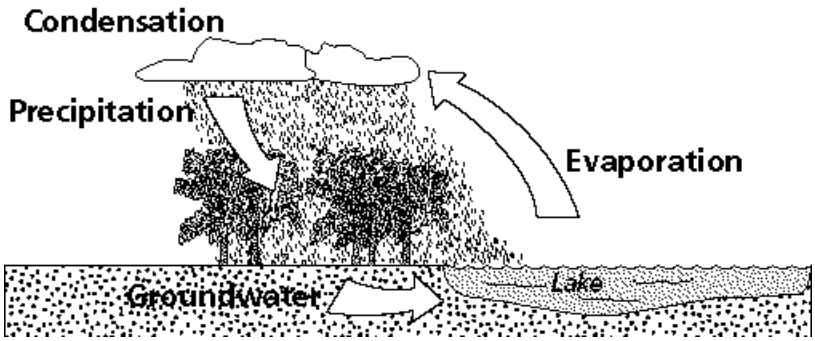

Figure 2-10

a. carbon
b. water
c. phosphorus
d. nitrogen

____ 30. The organism shown in Figure 2-12 is involved in which type of symbiosis?

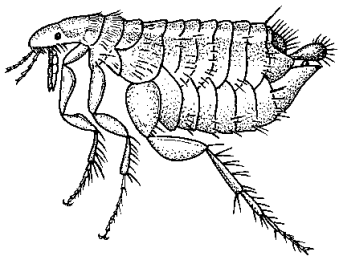

Figure 2-12

a. mutualism
b. commensalism
c. parasitism
d. predatorism

Completion

Complete each statement.

31. The _____ consists of evaporation, precipitation, transpiration, runoff, and respiration.
32. Ecosystems, biotic factors, and abiotic factors make up the _____.
33. Organism, population, and community make up the _____.
34. In a pond ecosystem, ducks, mosquitoes, pond plants, and frogs are _____ factors.
35. Both the alga and the fungus are benefited from their relationship in a lichen. This relationship is one of _____.
36. Water, carbon, and nitrogen are released back into the atmosphere during _____.
37. Energy that passes through a food chain is lost to the environment as _____.
38. To explain and show how the amount of living material at each trophic level of a food chain changes, you could use a pyramid of _____.
39. Before plants can reuse many organic materials, the materials must be broken down by _____.
40. In ecological classification, the next smallest level after the biosphere is the _____.

Matching

Match each item with the correct statement below.

a. mutualism
b. biosphere
c. ecology
d. biological community
e. decomposer
f. parasitism
g. habitat
h. food web
i. food chain
j. commensalism
k. scavenger
l. heterotroph
m. trophic level
n. autotroph

____ 41. study of how living things relate to each other and to their environment
____ 42. relationship between organisms in which both organisms benefit
____ 43. network of interconnected food chains
____ 44. relationship between organisms in which one organism benefits and the other is neither harmed nor benefited
____ 45. layer of Earth that supports life
____ 46. simple model for showing how matter and energy move through an ecosystem
____ 47. manufactures food using energy from the sun or from chemical compounds
____ 48. place where an organism spends its life
____ 49. obtains energy and nutrients from autotrophs
____ 50. breaks down dead organisms

Short Answer

51. Compare and contrast the ways carbon and water cycle through the biosphere.

52. List and describe the various levels of biological organization that may be studied by an ecologist.

53. Identify the abiotic and biotic factors in the picture in Figure 2-2.

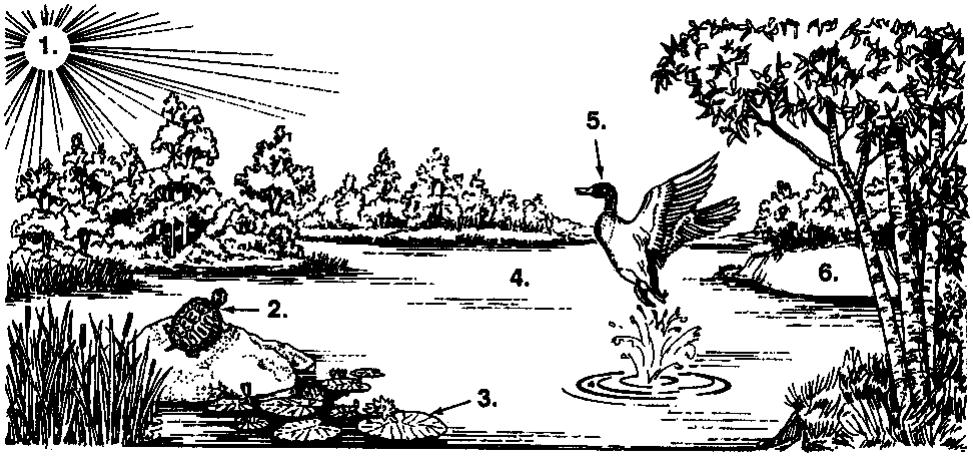

Figure 2-2

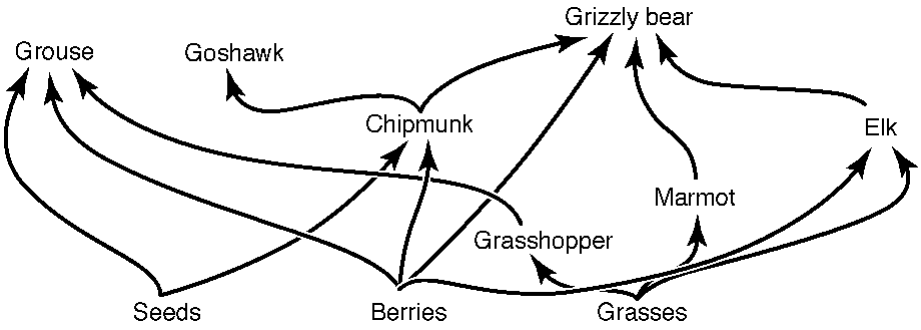

Figure 2-3

54. When a grouse eats berries, the berry seeds are eliminated as waste materials and may be dropped in another part of the forest where they may sprout and eventually grow into new berry plants. How would you classify the relationship between the berry plant and the grouse? Explain your reasoning. Refer to Figure 2-3.

55. Use the diagram in Figure 2-3 to complete Table 2-1. Classify each member of the food web as autotroph or heterotroph, and identify the heterotrophs as herbivores, carnivores, or omnivores.

Table 2-1

Autotrophs	Heterotrophs	Herbivore, carnivore, or omnivore

Problem

Milkweed is a plant commonly found throughout fields and pastures and along roadsides in eastern and central North America. It gets its name from the milky white sap that oozes when the plant is broken or cut. Milkweed plants bloom in June and July. When fertilized, the flowers form large seedpods that open in the fall. The following observations were taken from a scientist's field study of milkweed plants from spring through fall.

In the summer, the sugary nectar secreted by the milkweed's flowers attracts many bees, butterflies, moths, and a variety of smaller insects that carry away pollen when they depart. Milkweed nectar seems to be the major source of nutrition for several species of small moths, flies, mosquitoes, and ants. Monarch butterflies, which visit in large numbers, lay their eggs on milkweed plants, and the hatching caterpillars feed on the leaves. As fall approaches, milkweed bugs begin to attack the developing seeds, and milkweed beetles eat the foliage.

Aphids, which suck milkweed sap, are found throughout the year. Crab spiders do not feed on the plant itself, but rather on most of the insects that visit the plant. In the two to three weeks while the milkweed plants are in bloom, successful adult female crab spiders may increase ten times in mass before laying their eggs on the inner surface of leaves. Some species of flies and wasps, which feed on crab spider eggs, visit the plants periodically. Harvestmen, also known as "daddy longlegs," recover the remains left by predators.

56. Based on the scientist's observations, formulate two possible hypotheses about the effects of crab spiders on the survival of the milkweed plant.

57. From the scientist's data, infer which abiotic factor affects milkweed. Explain how the data support your inference.

58. Based on the scientist's observations, what is one food chain that begins with a milkweed plant?

59. How would you characterize the interactions between the milkweed and the organisms that visit or live on the plant?

60. Did this scientist perform quantitative or descriptive research?

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Answer Section

MULTIPLE CHOICE

1. ANS: B
   Ecology is defined as the study of interactions among organisms and their environments.

   PTS: 1
2. ANS: C
   The biosphere spans the region between the upper atmosphere and the bottom of the ocean. Within this region, living things can exist; outside the biosphere, conditions are not conducive to life.

   PTS: 1
3. ANS: D
   Biotic factors include all the living organisms that inhabit an environment. Bacteria are living organisms and are considered biotic factors.

   PTS: 1
4. ANS: A
   The highest level of organization within the biosphere is the ecosystem. An ecosystem consists of the interactions between a community and its abiotic surroundings.

   PTS: 1
5. ANS: D
   Bacteria and fungi are capable of decomposing all organisms after they die. Therefore, all trophic levels of organisms are consumed by decomposers.

   PTS: 1
6. ANS: B
   Pyramids of energy illustrate that the energy contained in each trophic level decreases as trophic level increases. After three or four links, little energy remains in the pyramid.

   PTS: 1
7. ANS: C
   The water cycle describes the recycling of water molecules. Water is neither created nor destroyed in the cycle. Thus, the amount of water remains constant throughout the cycle.

   PTS: 1
8. ANS: D
   Carbon is generally returned to the atmosphere in the form of carbon dioxide. For example, carbon dioxide is released when organisms exhale and when fossil fuels are burned.

   PTS: 1
9. ANS: A
   Nitrogen is converted to more usable forms by lightning and by bacteria. In addition, chemical fertilizers are composed of usable nitrogen.

PTS: 1

10. ANS: C PTS: 1 DIF: B OBJ: 2-6
NAT: C4 | C5 | C6
11. ANS: A PTS: 1 DIF: B OBJ: 2-6
NAT: C4 | C5 | C6
12. ANS: B PTS: 1 DIF: B OBJ: 2-6
NAT: C4 | C5 | C6
13. ANS: C PTS: 1 DIF: B OBJ: 2-2
NAT: C4 | C5 | C6
14. ANS: A PTS: 1 DIF: B OBJ: 2-3
NAT: C4 | C5 | C6
15. ANS: C PTS: 1 DIF: B OBJ: 2-3
NAT: C4 | C5 | C6
16. ANS: D PTS: 1 DIF: B OBJ: 2-2
NAT: C4 | C5 | C6
17. ANS: C PTS: 1 DIF: B OBJ: 2-2
NAT: C4 | C5 | C6
18. ANS: D PTS: 1 DIF: B OBJ: 2-5
NAT: C4 | C5 | C6
19. ANS: B PTS: 1 DIF: B OBJ: 2-5
NAT: C4 | C5 | C6
20. ANS: A PTS: 1 DIF: B OBJ: 2-2
NAT: C4 | C5 | C6
21. ANS: B PTS: 1 DIF: B OBJ: 2-4
NAT: C4 | C5 | C6
22. ANS: C PTS: 1 DIF: B OBJ: 2-5
NAT: C4 | C5 | C6
23. ANS: D PTS: 1 DIF: B OBJ: 2-1
NAT: C4 | C5 | C6
24. ANS: C PTS: 1 DIF: B OBJ: 2-1
NAT: C4 | C5 | C6
25. ANS: C PTS: 1 DIF: A OBJ: 2-2
NAT: C4 | C5 | C6
26. ANS: A PTS: 1 DIF: B OBJ: 2-5
NAT: C4 | C5 | C6
27. ANS: D PTS: 1 DIF: A OBJ: 2-5
NAT: C4 | C5 | C6
28. ANS: D PTS: 1 DIF: A OBJ: 2-5
NAT: C4 | C5 | C6
29. ANS: B PTS: 1 DIF: B OBJ: 2-6
NAT: C4 | C5 | C6
30. ANS: C PTS: 1 DIF: A OBJ: 2-2
NAT: C4 | C5 | C6

COMPLETION

31. ANS: water cycle

PTS: 1 DIF: B OBJ: 2-6 NAT: C4 | C5 | C6

32. ANS: biosphere

PTS: 1 DIF: B OBJ: 2-1 NAT: C4 | C5 | C6

33. ANS: ecosystem

PTS: 1 DIF: B OBJ: 2-2 NAT: C4 | C5 | C6

34. ANS: biotic

PTS: 1 DIF: B OBJ: 2-1 NAT: C4 | C5 | C6

35. ANS: mutualism

PTS: 1 DIF: B OBJ: 2-4 NAT: C4 | C5 | C6

36. ANS: decomposition

PTS: 1 DIF: B OBJ: 2-6 NAT: C4 | C5 | C6

37. ANS: heat

PTS: 1 DIF: B OBJ: 2-5 NAT: C4 | C5 | C6

38. ANS: biomass

PTS: 1 DIF: B OBJ: 2-5 NAT: C4 | C5 | C6

39. ANS: decomposers

PTS: 1 DIF: B OBJ: 2-4 NAT: C4 | C5 | C6

40. ANS: ecosystem

PTS: 1 DIF: B OBJ: 2-2 NAT: C4 | C5 | C6

MATCHING

41. ANS: C PTS: 1 DIF: B OBJ: 2-2
NAT: C4 | C5 | C6

42. ANS: A PTS: 1 DIF: B OBJ: 2-2
NAT: C4 | C5 | C6

43. ANS: H PTS: 1 DIF: B OBJ: 2-2
NAT: C4 | C5 | C6

44. ANS: J PTS: 1 DIF: B OBJ: 2-2
NAT: C4 | C5 | C6

45. ANS: B PTS: 1 DIF: B OBJ: 2-1
NAT: C4 | C5 | C6

46. ANS: I PTS: 1 DIF: B OBJ: 2-5
NAT: C4 | C5 | C6

47. ANS: N PTS: 1 DIF: B OBJ: 2-4
NAT: C4 | C5 | C6

48. ANS: G PTS: 1 DIF: B OBJ: 2-3
NAT: C4 | C5 | C6

49. ANS: L PTS: 1 DIF: B OBJ: 2-4
NAT: C4 | C5 | C6

50. ANS: E PTS: 1 DIF: B OBJ: 2-4
NAT: C4 | C5 | C6

SHORT ANSWER

51. ANS:
Answers will vary but should include that both carbon and water are found together in the biotic parts of the biosphere. The major reservoir for carbon is the atmosphere and oceans, while the major reservoir for water is the oceans. Students may describe or draw the water and carbon cycles.

PTS: 1 DIF: A OBJ: 2-6 NAT: C4 | C5 | C6

52. ANS:
Students should describe the levels of the individual organism, populations, communities, ecosystems, and the biosphere. Each level should be related to the levels above and below. Examples of each level might also be given.

PTS: 1 DIF: A OBJ: 2-2 NAT: C4 | C5 | C6

53. ANS:
1. abiotic, 2. biotic, 3. biotic, 4. abiotic, 5. biotic, 6. abiotic

PTS: 1 DIF: A OBJ: 2-1 NAT: C4 | C5 | C6

54. ANS:
The relationship is one of mutualism as the grouse benefits by getting food energy from the berries and the berry plant benefits by having its seeds dispersed; thus, its reproduction is aided.

PTS: 1 DIF: A OBJ: 2-2 NAT: C4 | C5 | C6

55. ANS:

Table 2-1

Autotrophs	Heterotrophs	Herbivore, carnivore, or omnivore
seeds	grasshopper	herbivore
berries	elk	herbivore
grasses	marmot	herbivore
	grouse	omnivore
	chipmunk	omnivore
	grizzly bear	omnivore
	goshawk	carnivore

PTS: 1 DIF: B OBJ: 2-4 NAT: C4 | C5 | C6

PROBLEM

56. ANS:
Answers may vary. Because the crab spiders feed on insects that help pollinate the milkweed plant, they threaten the reproductive success of those species. Because they feed on parasites, crab spiders increase the chances of an individual plant's survival.

PTS: 1 DIF: A OBJ: 2-5 NAT: C4 | C5 | C6

57. ANS:
The changing seasons affect the milkweed plant. The direct cause of this could be changes in temperature, light, or precipitation. Evidence that supports this inference includes (a) blooming of the milkweed flowers in June and July and (b) opening of the seedpods in the fall.

PTS: 1 DIF: A OBJ: 2-1 NAT: C4 | C5 | C6

58. ANS:
Answers may vary. Milkweed-mosquito-crab spider-harvestman.

PTS: 1 DIF: A OBJ: 2-5 NAT: C4 | C5 | C6

59. ANS:
The milkweed and its visitors form a community.

PTS: 1 DIF: B OBJ: 2-2 NAT: C4 | C5 | C6

60. ANS:
descriptive research

PTS: 1 DIF: A OBJ: 2-4 NAT: C4 | C5 | C6