

Student: _____

1. In the phosphorus cycle the ultimate source of phosphorus is
 - A. rock.
 - B. dead organisms.
 - C. plants.
 - D. the sun.
2. In the carbon cycle the two primary processes that remove and add carbon dioxide to the atmosphere are
 - A. predation and parasitism.
 - B. carnivores and herbivores.
 - C. sunlight and photosynthesis.
 - D. respiration and photosynthesis.
3. As with all organic molecules, carbon forms the backbone of the molecules that comprise plant tissue. This carbon comes from
 - A. the soil, and was taken up through the plant's roots.
 - B. the organic molecules produced by aerobic cellular respiration.
 - C. the atmosphere as CO₂.
 - D. the splitting of water molecules.
4. The role of decomposers is important to all of the following cycles except the
 - A. carbon cycle.
 - B. hydrologic cycle.
 - C. nitrogen cycle.
 - D. phosphorus cycle.
5. Most of the processes that influence the hydrologic cycle are
 - A. biological processes.
 - B. physical processes.
 - C. ecosystem processes.
 - D. wind processes.
6. The hydrologic cycle involves
 - A. the formation of water molecules from hydrogen and oxygen in the atmosphere.
 - B. the manufacture of water during photosynthesis in plants.
 - C. the consumption of water during aerobic cellular respiration.
 - D. None of these answers is correct.
7. A demonstration of the second law of thermodynamics is
 - A. the amount of energy coming from the sun.
 - B. that carnivores require more energy than herbivores.
 - C. that there is more producer biomass than herbivore biomass in an ecosystem.
 - D. the high proportion of protein in the diets of Americans.
8. The difference between an ecosystem and a community is that the ecosystem has something a community does not have; the ecosystem has
 - A. producers.
 - B. consumers.
 - C. nonliving parts.
 - D. interacting species.

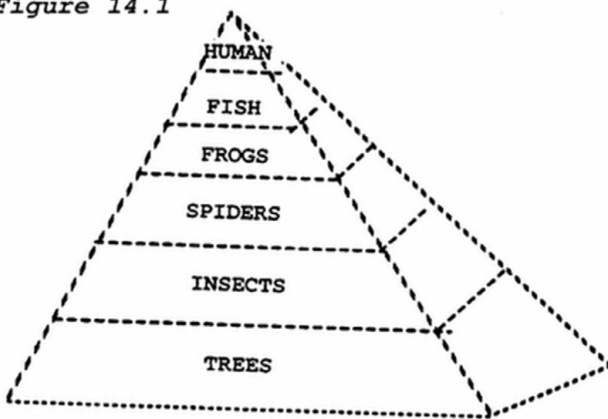
9. The amount of plant biomass in an area may increase if there is an increase in the amount of
- symbiotic nitrogen-fixing bacteria.
 - succession.
 - competition.
 - denitrifying bacteria.
10. Decomposers
- are unimportant links in a food web.
 - recycle organic to inorganic compounds.
 - cause disease and destruction.
 - require a source of light energy.
11. A food chain always begins with
- sympathetic decomposers.
 - photosynthetic autotrophs.
 - pathetic instructors.
 - heterotrophic consumers.
12. A food web is
- a long food chain.
 - several food chains that intersect.
 - a trap to catch food.
 - a complicated series of passages of energy via the first law of thermodynamics.
13. If it were part of a food web, a pigeon could be eaten by
- humans.
 - hawks.
 - cats and dogs.
 - All of these answers are true.
14. The environment of an organism would include its
- enemies.
 - food.
 - diseases.
 - All of these answers are true.
15. Which of the following is NOT recycled?
- nitrogen
 - water
 - energy
 - carbon
16. Which of the following is true of nitrogen?
- N_2 is scarce in the atmosphere, therefore, plants must obtain other sources of nitrogen.
 - Animals require nitrogen from the food they eat for the synthesis of carbohydrates and lipids.
 - Nitrogen-fixing bacteria convert N_2 into compounds plants can utilize.
 - Nitrogen is plant food and, therefore, provides plants with energy.
17. Which of the following can serve as a direct source of nitrogen for plants?
- nitrogen gas in the air
 - amino acids in dead organisms
 - ammonia from the decomposition of dead organisms
 - denitrifying bacteria in the soil
18. Pests that eat the same type of food as humans are part of our
- producers.
 - food web.
 - food chain.
 - All of these answers are true.

19. All food chains begin with a
- herbivore.
 - carnivore.
 - producer.
 - decomposer.
20. The amount of rain an area gets is part of an organism's
- biotic factors.
 - abiotic factors.
 - community.
 - succession.
21. Since snakes, people, and fish all like to eat frogs, this is an example of a
- food web.
 - food chain.
 - preference test.
 - trophic level variation.
22. Which is a food chain?
- grass-grasshopper-horse
 - fish-grasshopper-snake
 - light-grass-human
 - grass-cow-human
23. Nitrites ($--NO_2$) are converted to nitrogen gas (N_2) by
- decomposers.
 - nitrogen-fixing bacteria.
 - nitrifying bacteria.
 - denitrifying bacteria.
24. Which of the following would be at the highest trophic level?
- a lion
 - a grasshopper
 - a mushroom
 - a grass plant
25. Which of the following is likely to have the highest biomass in an ecosystem?
- grasshopper
 - frog
 - cow
 - grass
26. Which of the following is likely to have the lowest numbers in an ecosystem?
- producers
 - carnivores
 - herbivores
 - consumers
27. As energy passes through a food chain, approximately ____ percent is lost as it passes through each trophic level.
- 10
 - 25
 - 50
 - 90

28. Which of the following is part of the abiotic environment of an organism?
- A. grass
 - B. rain
 - C. food
 - D. decomposers
29. ____ convert nitrogen gas to nitrogen that plants can use.
- A. Decomposers
 - B. Nitrogen-fixing bacteria
 - C. Nitrifying bacteria
 - D. Denitrifying bacteria
30. If the world were to support the largest possible human population, all humans would need to be
- A. carnivores.
 - B. omnivores.
 - C. herbivores.
 - D. producers.
31. The nutrient that is in short supply for many people of the world is
- A. protein.
 - B. calories.
 - C. fat.
 - D. water.
32. Phosphorus is needed by organisms for
- A. DNA.
 - B. bones.
 - C. cell membranes.
 - D. All of these answers are correct.
33. The branch of science that deals with the study of organisms and how they interact with their environment is known as
- A. biology.
 - B. the biome.
 - C. ecology.
 - D. abiotic.
34. Which of the following would be a consumer?
- A. a cow
 - B. a tree
 - C. wind
 - D. grass
35. Ammonia (NH_3) is converted to nitrite (--NO_2) by
- A. decomposers.
 - B. nitrogen-fixing bacteria.
 - C. nitrifying bacteria.
 - D. denitrifying bacteria.
36. The nitrogen in your body came from the
- A. proteins in the food you eat.
 - B. carbohydrates in the food you eat.
 - C. air you breathe.
 - D. water you drink.

37. Human use of ecosystems
- is in harmony with natural ecosystems.
 - increases the number of animals present.
 - requires the alteration of previously existing ecosystems.
 - does not occur.
38. Which of the following is the largest conceptual unit?
- ecosystem
 - community
 - food chain
 - population
39. Which of the following would be a primary consumer?
- tree
 - decomposer
 - carnivore
 - herbivore

Figure 14.1



40. In the diagram above, the most biomass is contained within the
- trees.
 - insects.
 - frogs.
 - human.
41. The insects in the diagram above represent all of the following except
- herbivores.
 - the second trophic level.
 - primary consumers.
 - producers.
42. As represented in the diagram above, which of the following organisms are carnivores?
- human and fish only
 - human, fish, and frog only
 - human, fish, frog, and spider only
 - human, fish, frog, spider, and insect only
43. The ____ in the diagram above is a tertiary consumer.
- spider
 - frog
 - fish
 - human

44. The most energy is contained within the ____ in the figure diagram above.
- human
 - frogs
 - trees
 - Each level contains identical amounts of energy. (Energy cannot be created or destroyed.)
45. ____ in the figure diagram above represent consumers.
- Only the plants
 - Only the insects
 - Everything except trees
 - Spiders, frogs, fish, and humans
46. The spiders in the diagram above are
- tertiary consumers.
 - herbivores.
 - at the third trophic level.
 - omnivores.
47. If 100,000 units of energy are contained within the trees in the diagram above, ____ units of energy are stored within the ____.
- 1,000; spiders
 - 10; humans
 - 100; fish
 - 1,000; frogs
48. The following sequence of organisms represents all of the following except trees → insects → spiders → frogs → fish → human
- a food chain.
 - a food web.
 - the flow of energy through the community.
 - the flow of nutrients through the community.
49. The following sequence of organisms is not an accurate representation of a community in that frogs could actually feed upon insects or spiders, fish could feed on either frogs or insects, and humans enjoy fish, frogs, tree products, and, in some cases, even insects. A more complete representation of these interactions would be a(n) trees → insects → spiders → frogs → fish → human
- energy pyramid.
 - food chain.
 - biome schematic.
 - food web.
50. An animal that eats both plants and animals is
- a herbivore.
 - an omnivore.
 - a carnivore.
 - decomposer.
51. Producers are involved in which of the following processes?
- photosynthesis only
 - respiration only
 - both photosynthesis and respiration
 - None of the above is correct.
52. Each trophic level represents approximately a _____ percent energy _____.
- 10; loss
 - 90; transfer
 - 50; loss
 - 90; loss

53. A collection of interacting organisms of **different** species is a(n)
- ecosystem.
 - community.
 - population.
 - habitat.
54. All of the ____ are a community.
- sugar maple trees on Earth
 - living organisms in a forest
 - squirrels in a forest
 - living and nonliving things in the forest
55. ____ is a biotic factor in an ecosystem.
- Water
 - Light
 - Soil
 - A bacterium
56. Climate change (global warming) is directly related to
- the amount of carbon dioxide in the atmosphere.
 - humans eating protein.
 - the loss of carbon dioxide from the oceans.
 - the size of the human population.
57. Which one of the following is NOT true of biomass?
- Biomass is greatest in producers.
 - Biomass is a measure of productivity.
 - Biomass is the dry weight of organisms.
 - Biomass shows a loss of 10% at each trophic level.
58. If decomposers ceased to exist, you would expect
- photosynthesis to stop.
 - organic matter to build up.
 - few changes.
 - increased numbers of herbivores.
59. Energy is lost as one proceeds from the producer to herbivore trophic level because:
- herbivores must expend energy to chew and process food.
 - of the second law of thermodynamics.
 - herbivores lose heat to their surroundings.
 - All of the above are correct.
60. In the food chain grass \longrightarrow mice \longrightarrow coyotes:
- the total biomass of all the coyotes is greater than the total biomass of all the mice.
 - the mice are the producers.
 - the total amount of energy contained within the bodies of all the mice in the area is much greater than the total energy in the bodies of all the coyotes.
 - coyotes eat primarily grass.
61. A pyramid of numbers gives a reasonably accurate representation of the relationship between trophic levels when
- all the organisms are consumers.
 - all the organisms are about the same size.
 - all the organisms are the same age.
 - all the animals are carnivores.

62. The source of energy for nearly all ecosystems is
- the sun.
 - food.
 - oxygen.
 - water.
63. Ponds have pondweeds attached to the bottom, insect larvae that feed on the pondweeds, fish that eat the insects, and birds like great blue herons that eat the fish. In this ecosystem which of the following would have the largest total biomass (all individuals of the category)?
- large fish
 - small fish
 - insects
 - great blue herons
64. People who live in poor countries have diets that are made up primarily of plant materials. This is because
- plant foods are less expensive than are animal foods.
 - many calories would be lost if they fed plants to animals.
 - more people can be supported at the herbivore level than at the carnivore level.
 - All of these answers are true.
65. The atmosphere contains approximately ____ percent nitrogen.
- 2
 - 10
 - 50
 - 80
66. In general, there is about a _____ percent loss of energy as we proceed from one trophic level to the next higher level.
- 90
 - 80
 - 60
 - 50
67. Which of the following is the BEST example of a primary carnivore?
- lion
 - corn plant
 - shark
 - goat
68. Plants get the nitrogen they need to build additional cells from
- protein in the cells.
 - ammonia or nitrate in the soil.
 - denitrifying bacteria.
 - directly from the nitrogen in air.
69. Grass, mice, snakes, and hawks living together in the same geographic area constitute a/an
- ecosystem.
 - abiotic factor.
 - community.
 - environment.
70. Marine algae would be considered a part of which trophic level?
- producer
 - primary consumer
 - secondary consumer
 - tertiary consumer

71. Carbon first becomes part of a living thing as a result of
- nitrogen-fixing bacteria.
 - decomposer organisms.
 - photosynthesis.
 - aerobic respiration.
72. The nitrogen found in carnivores would follow which of the following paths?
- plant → air → carnivore
 - herbivore → plant → air → carnivore
 - air → bacteria → plant → herbivore → carnivore
 - air → plant → bacteria → herbivore → carnivore
73. The carbon found in carnivores would follow which of the following paths?
- plant → air → carnivore
 - herbivore → plant → air → carnivore
 - air → bacteria → plant → herbivore → carnivore
 - air → plant → herbivore → carnivore
74. In places where large numbers of seabirds or bats congregate for hundreds of years, the thick deposits of their droppings (called guano) can be a significant source of
- helium.
 - cyanide.
 - carbon.
 - phosphorus.
75. The loss of water from the surface of plants is
- transpiration.
 - dew.
 - biomagnification.
 - bioaccumulation.
76. Transpiration is
- the process by which bacteria converts ammonia into nitrite.
 - a type of symbiotic relationship.
 - the accumulation of a pesticide as it moves through a food chain.
 - the loss of water from plant surfaces.
77. Which of the following nutrient cycles relies heavily on the role of bacteria?
- carbon cycle
 - hydrologic cycle
 - nitrogen cycle
 - phosphorus cycle
78. This is defined as the rate at which an ecosystem can accumulate new organic matter.
- productivity
 - assimilation
 - energy cycling
 - thermodynamics

15 Key

1. In the phosphorus cycle the ultimate source of phosphorus is
A. rock.
B. dead organisms.
C. plants.
D. the sun.

Blooms Level: 1. Remember

Enger - Chapter 15 #1

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Section: 15.04

Topic: Biomes and Ecosystems

2. In the carbon cycle the two primary processes that remove and add carbon dioxide to the atmosphere are
A. predation and parasitism.
B. carnivores and herbivores.
C. sunlight and photosynthesis.
D. respiration and photosynthesis.

Blooms Level: 1. Remember

Enger - Chapter 15 #2

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Section: 15.04

Topic: Biomes and Ecosystems

3. As with all organic molecules, carbon forms the backbone of the molecules that comprise plant tissue. This carbon comes from
A. the soil, and was taken up through the plant's roots.
B. the organic molecules produced by aerobic cellular respiration.
C. the atmosphere as CO₂.
D. the splitting of water molecules.

Blooms Level: 2. Understand

Enger - Chapter 15 #3

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Section: 15.01

Section: 15.04

Topic: Biomes and Ecosystems

4. The role of decomposers is important to all of the following cycles except the
A. carbon cycle.
B. hydrologic cycle.
C. nitrogen cycle.
D. phosphorus cycle.

Blooms Level: 1. Remember

Enger - Chapter 15 #4

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Section: 15.04

Topic: Biomes and Ecosystems

5. Most of the processes that influence the hydrologic cycle are
A. biological processes.
B. physical processes.
C. ecosystem processes.
D. wind processes.

Blooms Level: 1. Remember

Enger - Chapter 15 #5

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Section: 15.04

Topic: Biomes and Ecosystems

6. The hydrologic cycle involves
A. the formation of water molecules from hydrogen and oxygen in the atmosphere.
B. the manufacture of water during photosynthesis in plants.
C. the consumption of water during aerobic cellular respiration.
D. None of these answers is correct.

*Blooms Level: 1. Remember
Enger - Chapter 15 #6*

*Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.
Section: 15.04*

Topic: Biomes and Ecosystems

7. A demonstration of the second law of thermodynamics is
A. the amount of energy coming from the sun.
B. that carnivores require more energy than herbivores.
C. that there is more producer biomass than herbivore biomass in an ecosystem.
D. the high proportion of protein in the diets of Americans.

*Blooms Level: 2. Understand
Enger - Chapter 15 #7*

*Learning Outcome: Describe why useful energy is lost as energy flows from one trophic level to the next.
Learning Outcome: Explain how energy is related to ecosystems.*

Section: 15.03

Topic: Biomes and Ecosystems

8. The difference between an ecosystem and a community is that the ecosystem has something a community does not have; the ecosystem has
A. producers.
B. consumers.
C. nonliving parts.
D. interacting species.

*Blooms Level: 2. Understand
Enger - Chapter 15 #8*

*Learning Outcome: Identify biotic and abiotic environmental factors.
Section: 15.01*

Section: 15.02

Topic: Biomes and Ecosystems

9. The amount of plant biomass in an area may increase if there is an increase in the amount of
A. symbiotic nitrogen-fixing bacteria.
B. succession.
C. competition.
D. denitrifying bacteria.

*Blooms Level: 2. Understand
Enger - Chapter 15 #9*

*Learning Outcome: Describe the importance of bacteria in nutrient cycles.
Section: 15.04*

Topic: Biomes and Ecosystems

10. Decomposers
A. are unimportant links in a food web.
B. recycle organic to inorganic compounds.
C. cause disease and destruction.
D. require a source of light energy.

*Blooms Level: 1. Remember
Enger - Chapter 15 #10*

*Learning Outcome: Describe the role of decomposers.
Section: 15.02*

Topic: Biomes and Ecosystems

11. A food chain always begins with
A. sympathetic decomposers.
B. photosynthetic autotrophs.
C. pathetic instructors.
D. heterotrophic consumers.

*Blooms Level: 1. Remember
Enger - Chapter 15 #11*

*Learning Outcome: Explain how energy is related to ecosystems.
Learning Outcome: Explain why plants are called producers.*

Section: 15.02

Topic: Biomes and Ecosystems

12. A food web is
A. a long food chain.
B. several food chains that intersect.
C. a trap to catch food.
D. a complicated series of passages of energy via the first law of thermodynamics.

*Blooms Level: 1. Remember
Enger - Chapter 15 #12*

*Learning Outcome: Explain how energy is related to ecosystems.
Section: 15.02
Section: 15.03*

Topic: Biomes and Ecosystems

13. If it were part of a food web, a pigeon could be eaten by
A. humans.
B. hawks.
C. cats and dogs.
D. All of these answers are true.

*Blooms Level: 2. Understand
Enger - Chapter 15 #13*

*Learning Outcome: Explain how energy is related to ecosystems.
Section: 15.02*

Topic: Biomes and Ecosystems

14. The environment of an organism would include its
A. enemies.
B. food.
C. diseases.
D. All of these answers are true.

*Blooms Level: 2. Understand
Enger - Chapter 15 #14*

*Learning Outcome: Identify biotic and abiotic environmental factors.
Section: 15.01*

Topic: Biomes and Ecosystems

15. Which of the following is NOT recycled?
A. nitrogen
B. water
C. energy
D. carbon

*Blooms Level: 2. Understand
Enger - Chapter 15 #15*

*Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.
Learning Outcome: Explain how energy is related to ecosystems.*

Section: 15.03

Section: 15.04

Topic: Biomes and Ecosystems

16. Which of the following is true of nitrogen?
A. N_2 is scarce in the atmosphere, therefore, plants must obtain other sources of nitrogen.
B. Animals require nitrogen from the food they eat for the synthesis of carbohydrates and lipids.
C. Nitrogen-fixing bacteria convert N_2 into compounds plants can utilize.
D. Nitrogen is plant food and, therefore, provides plants with energy.

*Blooms Level: 2. Understand
Enger - Chapter 15 #16*

*Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.
Learning Outcome: Explain why carbon and nitrogen must be recycled in ecosystems.*

Section: 15.04

Topic: Biomes and Ecosystems

17. Which of the following can serve as a direct source of nitrogen for plants?
A. nitrogen gas in the air
B. amino acids in dead organisms
C. ammonia from the decomposition of dead organisms
D. denitrifying bacteria in the soil

*Blooms Level: 2. Understand
Enger - Chapter 15 #17*

*Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.
Learning Outcome: Explain why carbon and nitrogen must be recycled in ecosystems.*

Section: 15.04

Topic: Biomes and Ecosystems

18. Pests that eat the same type of food as humans are part of our
- A. producers.
 - B.** food web.
 - C. food chain.
 - D. All of these answers are true.

*Blooms Level: 1. Remember
Enger - Chapter 15 #18*

*Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
Section: 15.01
Section: 15.02*

Topic: Biomes and Ecosystems

19. All food chains begin with a
- A. herbivore.
 - B. carnivore.
 - C.** producer.
 - D. decomposer.

*Blooms Level: 1. Remember
Enger - Chapter 15 #19*

*Learning Outcome: Explain why plants are called producers.
Section: 15.02*

Topic: Biomes and Ecosystems

20. The amount of rain an area gets is part of an organism's
- A. biotic factors.
 - B.** abiotic factors.
 - C. community.
 - D. succession.

*Blooms Level: 2. Understand
Enger - Chapter 15 #20*

*Learning Outcome: Identify biotic and abiotic environmental factors.
Section: 15.01*

Topic: Biomes and Ecosystems

21. Since snakes, people, and fish all like to eat frogs, this is an example of a
- A.** food web.
 - B. food chain.
 - C. preference test.
 - D. trophic level variation.

*Blooms Level: 2. Understand
Enger - Chapter 15 #21*

*Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
Section: 15.01
Section: 15.02*

Topic: Biomes and Ecosystems

22. Which is a food chain?
- A. grass-grasshopper-horse
 - B. fish-grasshopper-snake
 - C. light-grass-human
 - D.** grass-cow-human

*Blooms Level: 2. Understand
Enger - Chapter 15 #22*

*Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
Section: 15.01
Section: 15.02*

Topic: Biomes and Ecosystems

23. Nitrites (--NO_2) are converted to nitrogen gas (N_2) by
- A. decomposers.
 - B. nitrogen-fixing bacteria.
 - C. nitrifying bacteria.
 - D. denitrifying bacteria.**

*Blooms Level: 1. Remember
Enger - Chapter 15 #23*

*Learning Outcome: Describe the importance of bacteria in nutrient cycles.
Learning Outcome: Explain why carbon and nitrogen must be recycled in ecosystems.*

Section: 15.02

Section: 15.04

Topic: Biomes and Ecosystems

24. Which of the following would be at the highest trophic level?
- A. a lion**
 - B. a grasshopper
 - C. a mushroom
 - D. a grass plant

*Blooms Level: 2. Understand
Enger - Chapter 15 #24*

Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.

Section: 15.01

Section: 15.02

Topic: Biomes and Ecosystems

25. Which of the following is likely to have the highest biomass in an ecosystem?
- A. grasshopper
 - B. frog
 - C. cow
 - D. grass**

*Blooms Level: 2. Understand
Enger - Chapter 15 #25*

Learning Outcome: Describe the benefits and shortcomings of using each of the following: pyramid of numbers, pyramid of biomass, and pyramid of energy.

Section: 15.01

Section: 15.02

Topic: Biomes and Ecosystems

26. Which of the following is likely to have the lowest numbers in an ecosystem?
- A. producers
 - B. carnivores**
 - C. herbivores
 - D. consumers

*Blooms Level: 2. Understand
Enger - Chapter 15 #26*

Learning Outcome: Describe the benefits and shortcomings of using each of the following: pyramid of numbers, pyramid of biomass, and pyramid of energy.

Section: 15.01

Section: 15.02

Topic: Biomes and Ecosystems

27. As energy passes through a food chain, approximately ____ percent is lost as it passes through each trophic level.
- A. 10
 - B. 25
 - C. 50
 - D. 90**

*Blooms Level: 1. Remember
Enger - Chapter 15 #27*

Learning Outcome: Describe why useful energy is lost as energy flows from one trophic level to the next.

Learning Outcome: Explain how energy is related to ecosystems.

Section: 15.03

Topic: Biomes and Ecosystems

28. Which of the following is part of the abiotic environment of an organism?
A. grass
B. rain
C. food
D. decomposers

*Blooms Level: 1. Remember
Enger - Chapter 15 #28
Learning Outcome: Identify biotic and abiotic environmental factors.
Section: 15.01
Topic: Biomes and Ecosystems*

29. ____ convert nitrogen gas to nitrogen that plants can use.
A. Decomposers
B. Nitrogen-fixing bacteria
C. Nitrifying bacteria
D. Denitrifying bacteria

*Blooms Level: 1. Remember
Enger - Chapter 15 #29
Learning Outcome: Describe the importance of bacteria in nutrient cycles.
Section: 15.02
Section: 15.04
Topic: Biomes and Ecosystems*

30. If the world were to support the largest possible human population, all humans would need to be
A. carnivores.
B. omnivores.
C. herbivores.
D. producers.

*Blooms Level: 2. Understand
Enger - Chapter 15 #30
Learning Outcome: Describe why useful energy is lost as energy flows from one trophic level to the next.
Section: 15.02
Section: 15.03
Topic: Biomes and Ecosystems*

31. The nutrient that is in short supply for many people of the world is
A. protein.
B. calories.
C. fat.
D. water.

*Blooms Level: 1. Remember
Enger - Chapter 15 #31
Learning Outcome: Explain why people in poor countries eat mostly plant material.
Section: 15.02
Section: 15.03
Section: 15.05
Topic: Biomes and Ecosystems*

32. Phosphorus is needed by organisms for
A. DNA.
B. bones.
C. cell membranes.
D. All of these answers are correct.

*Blooms Level: 2. Understand
Enger - Chapter 15 #32
Learning Outcome: Identify biotic and abiotic environmental factors.
Section: 15.01
Section: 15.04
Topic: Biomes and Ecosystems*

33. The branch of science that deals with the study of organisms and how they interact with their environment is known as
- A. biology.
 - B. the biome.
 - C. ecology.**
 - D. abiotic.

*Blooms Level: 1. Remember
Enger - Chapter 15 #33
Learning Outcome: Identify biotic and abiotic environmental factors.
Section: 15.01
Topic: Biomes and Ecosystems*

34. Which of the following would be a consumer?
- A. a cow**
 - B. a tree
 - C. wind
 - D. grass

*Blooms Level: 2. Understand
Enger - Chapter 15 #34
Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
Section: 15.02
Topic: Biomes and Ecosystems*

35. Ammonia (NH₃) is converted to nitrite (--NO₂) by
- A. decomposers.
 - B. nitrogen-fixing bacteria.
 - C. nitrifying bacteria.**
 - D. denitrifying bacteria.

*Blooms Level: 1. Remember
Enger - Chapter 15 #35
Learning Outcome: Describe the importance of bacteria in nutrient cycles.
Section: 15.02
Section: 15.04
Topic: Biomes and Ecosystems*

36. The nitrogen in your body came from the
- A. proteins in the food you eat.**
 - B. carbohydrates in the food you eat.
 - C. air you breathe.
 - D. water you drink.

*Blooms Level: 2. Understand
Enger - Chapter 15 #36
Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.
Learning Outcome: Explain why animals must eat.
Learning Outcome: Identify biotic and abiotic environmental factors.
Section: 15.01
Section: 15.02
Section: 15.04
Topic: Biomes and Ecosystems*

37. Human use of ecosystems
- A. is in harmony with natural ecosystems.
 - B. increases the number of animals present.
 - C. requires the alteration of previously existing ecosystems.**
 - D. does not occur.

*Blooms Level: 2. Understand
Enger - Chapter 15 #37
Learning Outcome: Describe the kinds of ecosystems that have been converted to agriculture.
Section: 15.05
Topic: Biomes and Ecosystems*

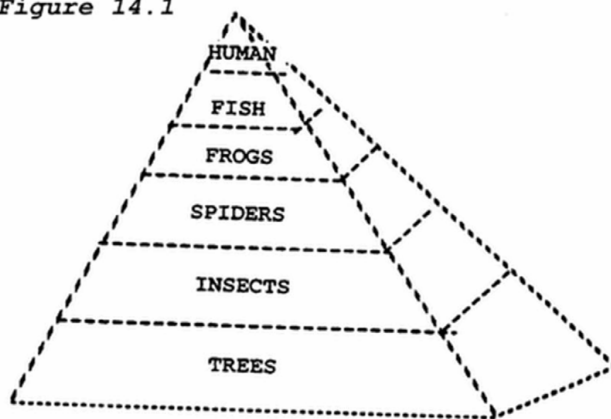
38. Which of the following is the largest conceptual unit?
A. ecosystem
 B. community
 C. food chain
 D. population

*Blooms Level: 2. Understand
 Enger - Chapter 15 #38
 Learning Outcome: Identify biotic and abiotic environmental factors.
 Section: 15.01
 Topic: Biomes and Ecosystems*

39. Which of the following would be a primary consumer?
 A. tree
 B. decomposer
 C. carnivore
D. herbivore

*Blooms Level: 2. Understand
 Enger - Chapter 15 #39
 Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
 Section: 15.02
 Topic: Biomes and Ecosystems*

Figure 14.1



40. In the diagram above, the most biomass is contained within the
A. trees.
 B. insects.
 C. frogs.
 D. human.

Enger - Chapter 15

*Blooms Level: 5. Evaluate
 Enger - Chapter 15 #40
 Learning Outcome: Describe the benefits and shortcomings of using each of the following: pyramid of numbers, pyramid of biomass, and pyramid of energy.
 Section: 15.03
 Topic: Biomes and Ecosystems*

41. The insects in the diagram above represent all of the following except
 A. herbivores.
 B. the second trophic level.
 C. primary consumers.
D. producers.

*Blooms Level: 2. Understand
 Enger - Chapter 15 #41
 Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
 Section: 15.02
 Section: 15.03
 Topic: Biomes and Ecosystems*

42. As represented in the diagram above, which of the following organisms are carnivores?
A. human and fish only
B. human, fish, and frog only
C. human, fish, frog, and spider only
D. human, fish, frog, spider, and insect only

*Blooms Level: 2. Understand
Enger - Chapter 15 #42*

*Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
Section: 15.02
Section: 15.03*

Topic: Biomes and Ecosystems

43. The ____ in the diagram above is a tertiary consumer.
A. spider
B. frog
C. fish
D. human

*Blooms Level: 2. Understand
Enger - Chapter 15 #43*

*Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
Section: 15.02
Section: 15.03*

Topic: Biomes and Ecosystems

44. The most energy is contained within the ____ in the figure diagram above.
A. human
B. frogs
C. trees
D. Each level contains identical amounts of energy. (Energy cannot be created or destroyed.)

*Blooms Level: 2. Understand
Enger - Chapter 15 #44*

Learning Outcome: Describe the benefits and shortcomings of using each of the following: pyramid of numbers, pyramid of biomass, and pyramid of energy.

*Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
Section: 15.02
Section: 15.03*

Topic: Biomes and Ecosystems

45. ____ in the figure diagram above represent consumers.
A. Only the plants
B. Only the insects
C. Everything except trees
D. Spiders, frogs, fish, and humans

*Blooms Level: 2. Understand
Enger - Chapter 15 #45*

*Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
Section: 15.02
Section: 15.03*

Topic: Biomes and Ecosystems

46. The spiders in the diagram above are
A. tertiary consumers.
B. herbivores.
C. at the third trophic level.
D. omnivores.

*Blooms Level: 2. Understand
Enger - Chapter 15 #46*

*Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
Section: 15.02
Section: 15.03*

Topic: Biomes and Ecosystems

47. If 100,000 units of energy are contained within the trees in the diagram above, ____ units of energy are stored within the ____.
- A.** 1,000; spiders
 - B. 10; humans
 - C. 100; fish
 - D. 1,000; frogs

Blooms Level: 4. Analyze

Enger - Chapter 15 #47

Learning Outcome: Describe why useful energy is lost as energy flows from one trophic level to the next.

Learning Outcome: Explain how energy is related to ecosystems.

Section: 15.03

Topic: Biomes and Ecosystems

48. The following sequence of organisms represents all of the following except trees → insects → spiders → frogs → fish → human
- A. a food chain.
 - B.** a food web.
 - C. the flow of energy through the community.
 - D. the flow of nutrients through the community.

Blooms Level: 2. Understand

Enger - Chapter 15 #48

Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.

Section: 15.03

Topic: Biomes and Ecosystems

49. The following sequence of organisms is not an accurate representation of a community in that frogs could actually feed upon insects or spiders, fish could feed on either frogs or insects, and humans enjoy fish, frogs, tree products, and, in some cases, even insects. A more complete representation of these interactions would be a(n) trees → insects → spiders → frogs → fish → human
- A. energy pyramid.
 - B. food chain.
 - C. biome schematic.
 - D.** food web.

Blooms Level: 2. Understand

Enger - Chapter 15 #49

Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.

Section: 15.03

Topic: Biomes and Ecosystems

50. An animal that eats both plants and animals is
- A. a herbivore.
 - B.** an omnivore.
 - C. a carnivore.
 - D. decomposer.

Blooms Level: 1. Remember

Enger - Chapter 15 #50

Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.

Section: 15.02

Topic: Biomes and Ecosystems

51. Producers are involved in which of the following processes?
- A. photosynthesis only
 - B. respiration only
 - C.** both photosynthesis and respiration
 - D. None of the above is correct.

Blooms Level: 1. Remember

Enger - Chapter 15 #51

Learning Outcome: Explain why plants are called producers.

Section: 15.02

Topic: Biomes and Ecosystems

52. Each trophic level represents approximately a _____ percent energy _____.
A. 10; loss
B. 90; transfer
C. 50; loss
D. 90; loss

*Blooms Level: 2. Understand
Enger - Chapter 15 #52*

*Learning Outcome: Describe why useful energy is lost as energy flows from one trophic level to the next.
Section: 15.02
Section: 15.03*

Topic: Biomes and Ecosystems

53. A collection of interacting organisms of **different** species is a(n)
A. ecosystem.
B. community.
C. population.
D. habitat.

*Blooms Level: 1. Remember
Enger - Chapter 15 #53*

*Learning Outcome: Identify biotic and abiotic environmental factors.
Section: 15.01*

Topic: Biomes and Ecosystems

54. All of the _____ are a community.
A. sugar maple trees on Earth
B. living organisms in a forest
C. squirrels in a forest
D. living and nonliving things in the forest

*Blooms Level: 2. Understand
Enger - Chapter 15 #54*

*Learning Outcome: Identify biotic and abiotic environmental factors.
Section: 15.01*

Topic: Biomes and Ecosystems

55. _____ is a biotic factor in an ecosystem.
A. Water
B. Light
C. Soil
D. A bacterium

*Blooms Level: 1. Remember
Enger - Chapter 15 #55*

*Learning Outcome: Identify biotic and abiotic environmental factors.
Section: 15.01*

Topic: Biomes and Ecosystems

56. Climate change (global warming) is directly related to
A. the amount of carbon dioxide in the atmosphere.
B. humans eating protein.
C. the loss of carbon dioxide from the oceans.
D. the size of the human population.

*Blooms Level: 2. Understand
Enger - Chapter 15 #56*

*Learning Outcome: Describe the kinds of ecosystems that have been converted to agriculture.
Section: 15.05*

Topic: Biomes and Ecosystems

57. Which one of the following is NOT true of biomass?
A. Biomass is greatest in producers.
B. Biomass is a measure of productivity.
C. Biomass is the dry weight of organisms.
D. Biomass shows a loss of 10% at each trophic level.

*Blooms Level: 2. Understand
Enger - Chapter 15 #57*

*Learning Outcome: Describe the benefits and shortcomings of using each of the following: pyramid of numbers, pyramid of biomass, and pyramid of energy.
Section: 15.03*

Topic: Biomes and Ecosystems

58. If decomposers ceased to exist, you would expect
- A. photosynthesis to stop.
 - B.** organic matter to build up.
 - C. few changes.
 - D. increased numbers of herbivores.

Blooms Level: 2. Understand
Enger - Chapter 15 #58
Learning Outcome: Describe the role of decomposers.
Section: 15.02
Topic: Biomes and Ecosystems

59. Energy is lost as one proceeds from the producer to herbivore trophic level because:
- A. herbivores must expend energy to chew and process food.
 - B. of the second law of thermodynamics.
 - C. herbivores lose heat to their surroundings.
 - D.** All of the above are correct.

Blooms Level: 2. Understand
Enger - Chapter 15 #59
Learning Outcome: Describe why useful energy is lost as energy flows from one trophic level to the next.
Section: 15.03
Topic: Biomes and Ecosystems

60. In the food chain grass \longrightarrow mice \longrightarrow coyotes:
- A. the total biomass of all the coyotes is greater than the total biomass of all the mice.
 - B. the mice are the producers.
 - C.** the total amount of energy contained within the bodies of all the mice in the area is much greater than the total energy in the bodies of all the coyotes.
 - D. coyotes eat primarily grass.

Blooms Level: 3. Apply
Enger - Chapter 15 #60
Learning Outcome: Recognize the types of relationships that organisms have to each other.
Section: 15.02
Topic: Biomes and Ecosystems

61. A pyramid of numbers gives a reasonably accurate representation of the relationship between trophic levels when
- A. all the organisms are consumers.
 - B.** all the organisms are about the same size.
 - C. all the organisms are the same age.
 - D. all the animals are carnivores.

Blooms Level: 2. Understand
Enger - Chapter 15 #61
Learning Outcome: Describe the benefits and shortcomings of using each of the following: pyramid of numbers, pyramid of biomass, and pyramid of energy.
Section: 15.03
Topic: Biomes and Ecosystems

62. The source of energy for nearly all ecosystems is
- A.** the sun.
 - B. food.
 - C. oxygen.
 - D. water.

Blooms Level: 1. Remember
Enger - Chapter 15 #62
Learning Outcome: Explain how energy is related to ecosystems.
Section: 15.01
Section: 15.03
Topic: Biomes and Ecosystems

63. Ponds have pondweeds attached to the bottom, insect larvae that feed on the pondweeds, fish that eat the insects, and birds like great blue herons that eat the fish. In this ecosystem which of the following would have the largest total biomass (all individuals of the category)?
- A. large fish
 - B. small fish
 - C. insects**
 - D. great blue herons

*Blooms Level: 2. Understand
Enger - Chapter 15 #63*

*Learning Outcome: Describe the benefits and shortcomings of using each of the following: pyramid of numbers, pyramid of biomass, and pyramid of energy.
Section: 15.03
Topic: Biomes and Ecosystems*

64. People who live in poor countries have diets that are made up primarily of plant materials. This is because
- A. plant foods are less expensive than are animal foods.
 - B. many calories would be lost if they fed plants to animals.
 - C. more people can be supported at the herbivore level than at the carnivore level.
 - D. All of these answers are true.**

*Blooms Level: 2. Understand
Enger - Chapter 15 #64*

*Learning Outcome: Explain why people in poor countries eat mostly plant material.
Section: 15.05
Topic: Biomes and Ecosystems*

65. The atmosphere contains approximately ____ percent nitrogen.
- A. 2
 - B. 10
 - C. 50
 - D. 80**

*Blooms Level: 1. Remember
Enger - Chapter 15 #65*

*Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.
Section: 15.04
Topic: Biomes and Ecosystems*

66. In general, there is about a _____ percent loss of energy as we proceed from one trophic level to the next higher level.
- A. 90**
 - B. 80
 - C. 60
 - D. 50

*Blooms Level: 2. Understand
Enger - Chapter 15 #66*

*Learning Outcome: Describe why useful energy is lost as energy flows from one trophic level to the next.
Section: 15.02
Section: 15.03
Topic: Biomes and Ecosystems*

67. Which of the following is the BEST example of a primary carnivore?
- A. lion**
 - B. corn plant
 - C. shark
 - D. goat

*Blooms Level: 1. Remember
Enger - Chapter 15 #67*

*Learning Outcome: Identify biotic and abiotic environmental factors.
Learning Outcome: Identify the trophic levels occupied by herbivores and carnivores and why they are called consumers.
Section: 15.02
Topic: Biomes and Ecosystems*

68. Plants get the nitrogen they need to build additional cells from
- A. protein in the cells.
 - B.** ammonia or nitrate in the soil.
 - C. denitrifying bacteria.
 - D. directly from the nitrogen in air.

*Blooms Level: 1. Remember
Enger - Chapter 15 #68*

*Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.
Learning Outcome: Explain why carbon and nitrogen must be recycled in ecosystems.*

Section: 15.04

Topic: Biomes and Ecosystems

69. Grass, mice, snakes, and hawks living together in the same geographic area constitute a/an
- A. ecosystem.
 - B. abiotic factor.
 - C.** community.
 - D. environment.

*Blooms Level: 2. Understand
Enger - Chapter 15 #69*

Learning Outcome: Identify biotic and abiotic environmental factors.

Section: 15.01

Section: 15.02

Topic: Biomes and Ecosystems

70. Marine algae would be considered a part of which trophic level?
- A.** producer
 - B. primary consumer
 - C. secondary consumer
 - D. tertiary consumer

*Blooms Level: 2. Understand
Enger - Chapter 15 #70*

Learning Outcome: Explain why plants are called producers.

Section: 15.02

Topic: Biomes and Ecosystems

71. Carbon first becomes part of a living thing as a result of
- A. nitrogen-fixing bacteria.
 - B. decomposer organisms.
 - C.** photosynthesis.
 - D. aerobic respiration.

*Blooms Level: 1. Remember
Enger - Chapter 15 #71*

Learning Outcome: Explain why plants are called producers.

Section: 15.02

Topic: Biomes and Ecosystems

72. The nitrogen found in carnivores would follow which of the following paths?
- A. plant → air → carnivore
 - B. herbivore → plant → air → carnivore
 - C.** air → bacteria → plant → herbivore → carnivore
 - D. air → plant → bacteria → herbivore → carnivore

*Blooms Level: 2. Understand
Enger - Chapter 15 #72*

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Section: 15.02

Section: 15.04

Topic: Biomes and Ecosystems

73. The carbon found in carnivores would follow which of the following paths?
- A. plant → air → carnivore
 - B. herbivore → plant → air → carnivore
 - C. air → bacteria → plant → herbivore → carnivore
 - D.** air → plant → herbivore → carnivore

Blooms Level: 2. Understand

Enger - Chapter 15 #73

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Section: 15.02

Section: 15.04

Topic: Biomes and Ecosystems

74. In places where large numbers of seabirds or bats congregate for hundreds of years, the thick deposits of their droppings (called guano) can be a significant source of
- A. helium.
 - B. cyanide.
 - C. carbon.
 - D.** phosphorus.

Blooms Level: 1. Remember

Enger - Chapter 15 #74

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Section: 15.02

Section: 15.04

Topic: Biomes and Ecosystems

75. The loss of water from the surface of plants is
- A.** transpiration.
 - B. dew.
 - C. biomagnification.
 - D. bioaccumulation.

Blooms Level: 1. Remember

Enger - Chapter 15 #75

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Section: 15.04

Topic: Biomes and Ecosystems

76. Transpiration is
- A. the process by which bacteria converts ammonia into nitrite.
 - B. a type of symbiotic relationship.
 - C. the accumulation of a pesticide as it moves through a food chain.
 - D.** the loss of water from plant surfaces.

Blooms Level: 1. Remember

Enger - Chapter 15 #76

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Section: 15.04

Topic: Biomes and Ecosystems

77. Which of the following nutrient cycles relies heavily on the role of bacteria?
- A. carbon cycle
 - B. hydrologic cycle
 - C.** nitrogen cycle
 - D. phosphorus cycle

Blooms Level: 1. Remember

Enger - Chapter 15 #77

Learning Outcome: Describe the flow of atoms through the carbon, nitrogen, phosphorus, and hydrologic cycles.

Learning Outcome: Describe the importance of bacteria in nutrient cycles.

Section: 15.04

Topic: Biomes and Ecosystems

78. This is defined as the rate at which an ecosystem can accumulate new organic matter.
- A.** productivity
 - B. assimilation
 - C. energy cycling
 - D. thermodynamics

*Blooms Level: 1. Remember
Enger - Chapter 15 #78*

*Learning Outcome: Explain why plants are called producers.
Learning Outcome: Identify biotic and abiotic environmental factors.*

Section: 15.01

Section: 15.03

Section: 15.04

Topic: Biomes and Ecosystems

15 Summary

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