



## Chapter 46 Exercises

### Review Questions

- The ability of an ecosystem to return to its equilibrium state after an environmental disturbance is called \_\_\_\_\_.
  - resistance
  - restoration
  - reformation
  - resilience
- A recreated ecosystem in a laboratory environment is known as a \_\_\_\_\_.
  - mesocosm
  - simulation
  - microcosm
  - reproduction
- Decomposers are associated with which class of food web?
  - grazing
  - detrital
  - inverted
  - aquatic
- The primary producers in an ocean grazing food web are usually \_\_\_\_\_.
  - plants
  - animals
  - fungi
  - phytoplankton
- What term describes the use of mathematical equations in the modeling of linear aspects of ecosystems?
  - analytical modeling
  - simulation modeling
  - conceptual modeling
  - individual-based modeling
- The position of an organism along a food chain is known as its \_\_\_\_\_.
  - locus
  - location
  - trophic level
  - microcosm
- The loss of an apex consumer would impact which trophic level of a food web?
  - primary producers
  - primary consumers
  - secondary consumers
  - all of these
- A food chain would be a better resource than a food web to answer which question?
  - How does energy move from an organism in one trophic level to an organism on the next trophic level?
  - How does energy move within a trophic level?
  - What preys on grasses?
  - How is organic matter recycled in a forest?
- The weight of living organisms in an ecosystem at a particular point in time is called \_\_\_\_\_.
  - energy
  - production
  - entropy
  - biomass
- Which term describes the process whereby toxic substances increase along trophic levels of an ecosystem?
  - biomassification
  - biomagnification
  - bioentropy
  - heterotrophy
- Organisms that can make their own food using inorganic molecules are called \_\_\_\_\_.
  - autotrophs
  - heterotrophs
  - photoautotrophs
  - chemoautotrophs

12. In the English Channel ecosystem, the number of primary producers is smaller than the number of primary consumers because \_\_\_\_\_.
- the apex consumers have a low turnover rate
  - the primary producers have a low turnover rate
  - the primary producers have a high turnover rate
  - the primary consumers have a high turnover rate
13. What law of chemistry determines how much energy can be transferred when it is converted from one form to another?
- the first law of thermodynamics
  - the second law of thermodynamics
  - the conservation of matter
  - the conservation of energy
14. The mussels that live at the NW Eifuku volcano are examples of \_\_\_\_\_.
- chemoautotrophs
  - photoautotrophs
  - apex predators
  - primary consumers
15. The movement of mineral nutrients through organisms and their environment is called a \_\_\_\_\_ cycle.
- biological
  - bioaccumulation
  - biogeochemical
  - biochemical
16. Most carbon is present in the atmosphere as \_\_\_\_\_.
- carbon dioxide
  - carbonate ion
  - carbon dust
  - carbon monoxide
17. The majority of water found on Earth is \_\_\_\_\_.
- ice
  - water vapor
  - fresh water
  - salt water
18. The average time a molecule spends in its reservoir is known as \_\_\_\_\_.
- residence time
  - restriction time
  - resilience time
  - storage time
19. The process whereby oxygen is depleted by the growth of microorganisms due to excess nutrients in aquatic systems is called \_\_\_\_\_.
- dead zoning
  - eutrophication
  - retrofitation
  - depletion
20. The process whereby nitrogen is brought into organic molecules is called \_\_\_\_\_.
- nitrification
  - denitrification
  - nitrogen fixation
  - nitrogen cycling
21. Which of the following approaches would be the most effective way to reduce greenhouse carbon dioxide?
- increase waste deposition into the deep ocean
  - plant more environmentally suitable plants
  - increase use of fuel sources that do not produce carbon dioxide as a byproduct
  - decrease livestock agriculture
22. How would loss of fungi in a forest effect biogeochemical cycles in the area?
- Nitrogen could no longer be fixed into organic molecules.
  - Phosphorus stores would be released for use by other organisms.
  - Sulfur release from eroding rocks would cease.
  - Carbon would accumulate in dead organic matter and waste.

### Critical Thinking Questions

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23. Compare and contrast food chains and food webs. What are the strengths of each concept in describing ecosystems?
24. Describe freshwater, ocean, and terrestrial ecosystems.
25. Compare grazing and detrital food webs. Why would they both be present in the same ecosystem?
26. How does the microcosm modeling approach differ from utilizing a holistic model for ecological research?
27. How do conceptual and analytical models of ecosystems complement each other?
28. Compare the three types of ecological pyramids and how well they describe ecosystem structure. Identify which ones can be inverted and give an example of an inverted pyramid for each.
29. How does the amount of food a warm-blooded animal (endotherm) eats relate to its net production efficiency (NPE)?
30. A study uses an inverted pyramid to demonstrate the relationship between sharks, their aquatic prey, and phytoplankton in an ocean region. What type of pyramid must be used? What does this convey to readers about predation in the area?
31. Describe what a pyramid of numbers would look like if an ecologist modeled the relationship between bird parasites, blue jays, and oak trees in a hectare. Does this match the energy flow pyramid?
32. Describe nitrogen fixation and why it is important to agriculture.
33. What are the factors that cause dead zones? Describe eutrophication, in particular, as a cause.
34. Why are drinking water supplies still a major concern for many countries?
35. Discuss how the human disruption of the carbon cycle has caused ocean acidification.