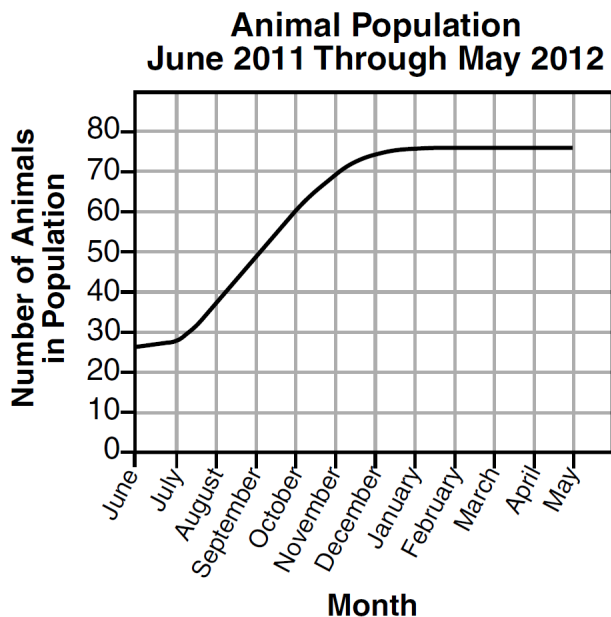


Ecology Review

1. A fundamental concept of ecology is that living organisms
 - A) are independent and do not interact with each other or with the physical environment.
 - B) do not interact with other living organisms, but do interact with the physical environment
 - C) interact with each other, but do not interact with the physical environment
 - D) interact with other living organisms and interact with the physical environment**
2. Base your answer to the following question on the information and graph below and on your knowledge of biology. The graph shows the number of animals in a population throughout the course of a year. The population migrated into the area at the beginning of 2011.



The approximate number of animals that were found in June 2012 was most likely

- A) 16 B) 26 C) **76** D) 86
-

3. Sharks are often followed by smaller fish that eat some of the scraps from the organisms eaten by the shark. These smaller fish are acting as
 - A) decomposers
 - B) scavengers**
 - C) producers
 - D) herbivores

Ecology Review

4. The table below shows the results of a study on the lifespan of 115 individual song sparrows.

Song Sparrow Lifespan

Year	Number at Start of Year	Number at End of Year
1	115	25
2	25	19
3	19	12
4	12	2
5	2	1
6	1	0

The two most likely factors contributing to the decline in the number of these 115 sparrows during year 1 were

- A) favorable climate and a rapid reproduction rate
- B) lack of predators and an expanding habitat
- C) lack of mating and loss of nesting sites
- D) disease and predation**

5. Which statement best describes how a major change in the size of one population affects an ecosystem?

- A) It will immediately affect every population and the physical conditions.
- B) It will affect the physical conditions, but not the other populations.
- C) It could directly or indirectly affect the physical conditions and any population.**
- D) It affects every population, not the physical conditions.

6. A corn field includes corn plants, mice, hawks, and various insects, fungi, and bacteria. Which nutritional role is correctly paired with organisms that carry out that role?

- A) heterotrophs - corn and bacteria
- B) producers - insects and fungi
- C) consumers - mice and insects**
- D) decomposers - hawks and bacteria

7. A stable ecosystem can have high biodiversity because each species in that ecosystem

- A) occupies a difference niche**
- B) inhabits a different environment
- C) is part of a different community
- D) lives in a different biosphere

8. An example of competition between members of two different species is

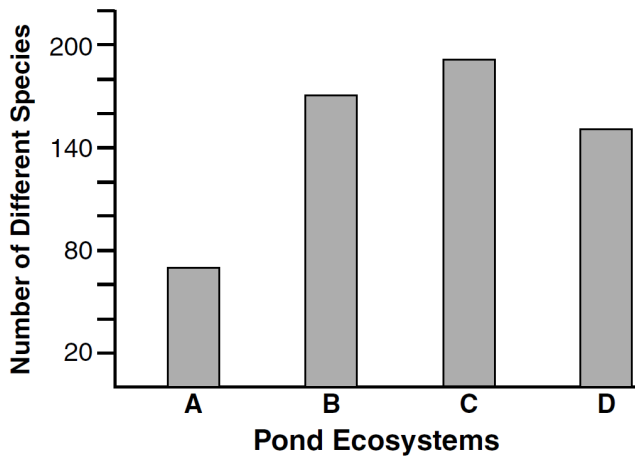
- A) mold growing on a dead tree that has fallen in the forest
- B) purple loosestrife plants growing in the same wet areas as cattail plants**
- C) a coyote feeding on the remains of a deer that died of starvation
- D) two male turkeys displaying mating behaviors to attract a female turkey

9. The removal of the predator populations from an ecosystem would most likely result in

- A) a decrease in all the prey populations
- B) an increase in all the producer populations
- C) an increase in ecosystem diversity
- D) a decrease in ecosystem diversity**

10. The bar graph below shows the number of species in four pond ecosystems.

Number of Species in Four Pond Ecosystems



Based on this information, which ecosystem is likely to be the most stable?

- A) *A* B) *B* C) *C* D) *D*
11. The brown tree snake was accidentally introduced to the island of Guam during World War II. Since then, this snake has caused the extinction of twelve native bird species by eating their eggs and young.



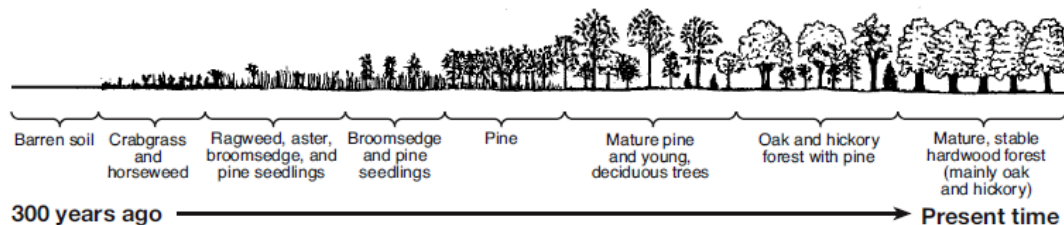
Source: www.aquariumlife.com.au

One negative result of this snake's introduction was most likely

- A) an increase in diversity as new species evolved to replace extinct species
B) an increase in mosquitoes due to an increase in bird species in the environment
C) **a disruption of food chains and food webs in Guam's ecosystems**
D) an abundance of brown tree snakes as a good source for humans

Ecology Review

12. The diagram below represents a process that occurs in nature.



If the oak and hickory trees were burned in a forest fire, leaving bare soil, which group of plants would most likely be the first to grow back?

- A) **crabgrass and horseweed** B) oak and hickory trees
 C) broomsedge and pine seedlings D) mature pine and young deciduous trees

13. Shawangunk Grasslands National Wildlife Refuge has been developed from an abandoned airport to restore habitat for six species of birds that require an area rich in tall grasses. Workers must continually remove trees that are beginning to invade the area as a result of

- A) direct harvesting
 B) genetic engineering
 C) evolutionary change
 D) **ecological succession**

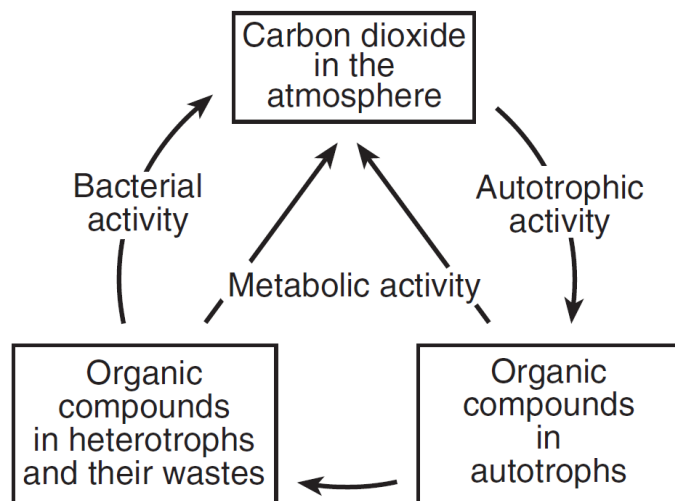
14. In New York State, small farms that were abandoned many years ago have become hardwood forests. This is an example of

- A) local deforestation
 B) biotechnology
 C) **ecological succession**
 D) habitat loss

15. If the grass in the front yard of an abandoned house is not cut for several years, the yard may become overgrown with taller grasses, bushes, and shrubs. This is an example of the process of

- A) evolution
 B) homeostasis
 C) **ecological succession**
 D) direct harvesting

16. The diagram below represents a cycle that occurs in nature.



Which phrase describes a human activity that could have a *negative* effect on this cycle?

- A) a decrease in the amount of sulfates given off by motor vehicles
 B) an increase in recycling programs for plastics and metals
 C) **the continued deforestation and removal of forest resources**
 D) development of programs to conserve wildlife

17. In a food web, which type of organism receives energy from the other three types?

- A) producer B) carnivore
 C) **decomposer** D) herbivore

Ecology Review

18. Which row in the chart below shows a direct relationship that can exist between two living organisms?

Row	Relationship
(1)	producer – carnivore
(2)	predator – prey
(3)	parasite – prey
(4)	carnivore – host

- A) 1 **B) 2** C) 3 D) 4
19. Mistletoe is a plant that lives on the branches of trees. The mistletoe plant sends its roots in through the bark of trees and takes away water and minerals that the tree needs. In this situation, the mistletoe plant is
- A) a parasite B) a predator
C) a decomposer D) an autotroph
20. Mistletoe is an evergreen shrub that can produce most of its own food. Often, mistletoe can be found living on trees and taking water and nutrients away from the tissues of the trees.



The relationship between mistletoe and trees is an example of

- A) consumer/herbivore B) predator/prey
C) scavenger/decomposer **D) parasite/host**
-

Ecology Review

21. The diagram below represents a remora fish attached to a shark.

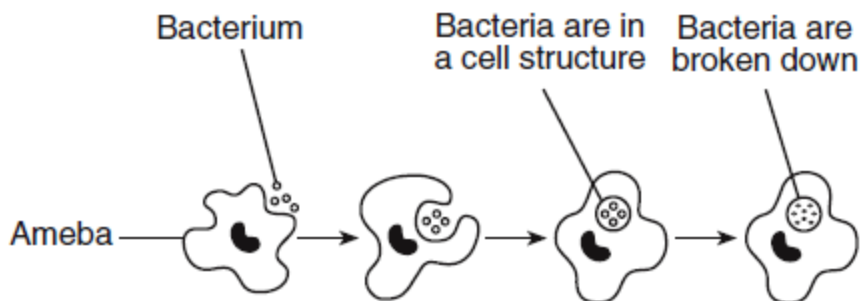


A remora fish has an adhesive disk or sucker on its head, which it uses to attach itself to larger fishes, such as sharks. This attachment causes the shark no harm. The remora fish eat scraps of food that the sharks drop as they feed. This is an example of

- A) **an adaptation to a specialized niche**
 - B) an adaptation of a successful parasite
 - C) competition between two fish species for food
 - D) competition for abiotic resources
-
22. Which statement is an example of the interdependence of organisms?
- A) Owls hunt at night.
 - B) **Ants get food from insects and protect insects from predators.**
 - C) Ticks feed on the blood of animals and the ticks grow larger.
 - D) Crows feed on dead mice.
23. Producers are generally found at the beginning of a food chain. Which statement best explains why this is true?
- A) Producers are usually smaller in size than consumers.
 - B) **Producers do not rely on other organisms for food.**
 - C) There are always more consumers than producers in food chains.
 - D) Consumers are always more complex organisms than producers.
24. A fruit fly is classified as a consumer rather than as a producer because it is unable to
- A) reproduce asexually
 - B) **synthesize its own food**
 - C) release energy stored in organic molecules
 - D) remove wastes from its body
-

Ecology Review

25. Base your answer to the following question on the diagram below, which represents an amoeba engulfing bacteria, and on your knowledge of biology.

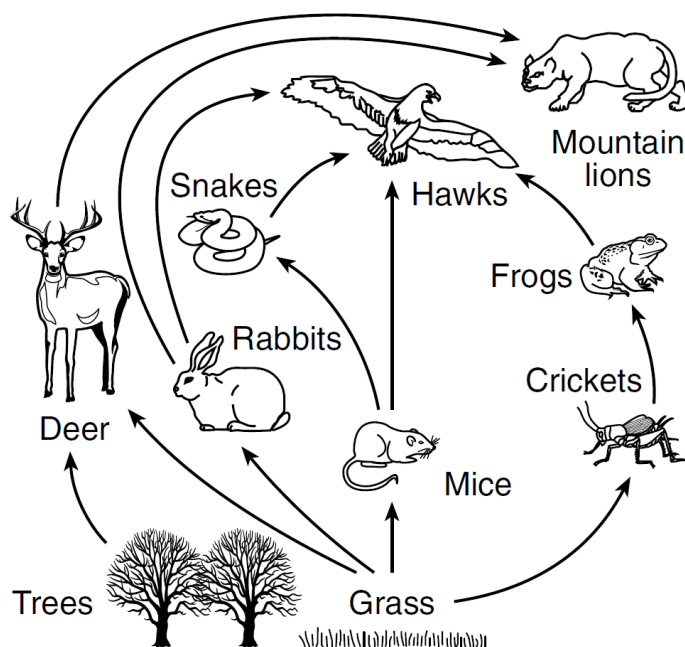


This amoeba would most likely be classified as a

- A) decomposer B) producer C) **consumer** D) pathogen
26. Which process occurs at each link in a food chain?

- A) All the energy is stored in a newly made structure.
B) **Some energy is released into the environment as heat.**
C) Chemical energy is recycled.
D) Atoms cycle among living organisms, producing energy.

27. Base your answer to the following question on the diagram below and on your knowledge of biology.

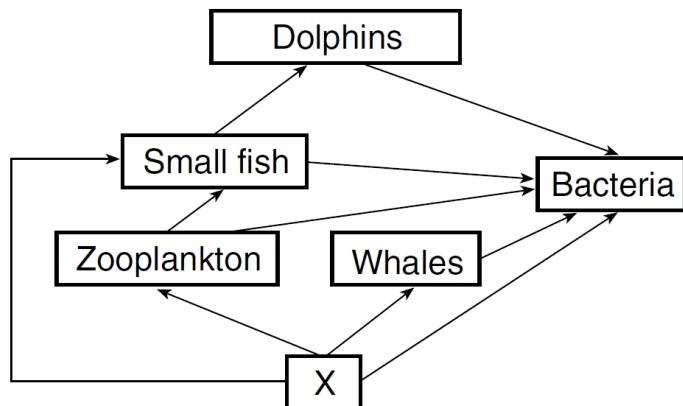


A factor *not* shown in the diagram that provides energy for living organisms is

- A) carbon dioxide B) water
C) **the Sun** D) oxygen

Ecology Review

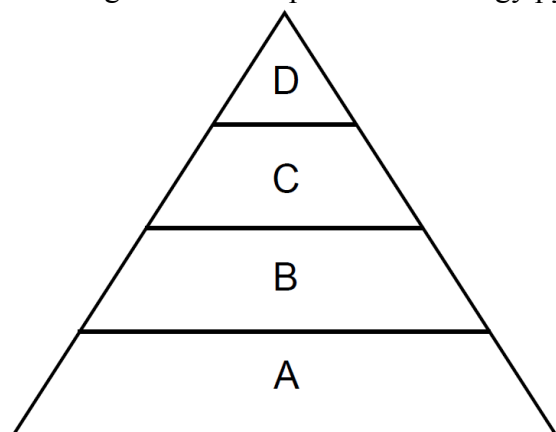
28. The diagram below represents a marine food web.



The organisms represented by *X* are

- A) decomposers **B) producers**
 C) carnivores D) scavengers

29. The diagram below represents an energy pyramid.



Which type of organism could occupy levels *B*, *C*, and *D* of this energy pyramid?

- A) consumer** B) producer
 C) autotroph D) carnivore

30. Recently, oil from a wrecked tanker resulted in a disaster in ecosystems containing many unique species. The potential loss of these species could result in

- A) an increase in the variety of genetic material available
B) a decrease in organisms available for scientific research
 C) an increase in the stability of the affected ecosystems
 D) a decrease in pollution affecting the land and water

31. For centuries, humans have used resources from coastal areas and open ocean waters. An example of an activity that would promote the conservation of coastal areas and ocean resources is

- A) harvesting large numbers of different fish species.
 B) allowing all-terrain vehicles access to beach areas
C) creating protected zones of natural grasses and shrubs in beach areas
 D) encouraging the construction of factories along the ocean shoreline

32. The overuse of chemical fertilizers has resulted in the growth of some lawns in which decomposers cannot live. This would interfere most directly with the ability of the lawn ecosystem to

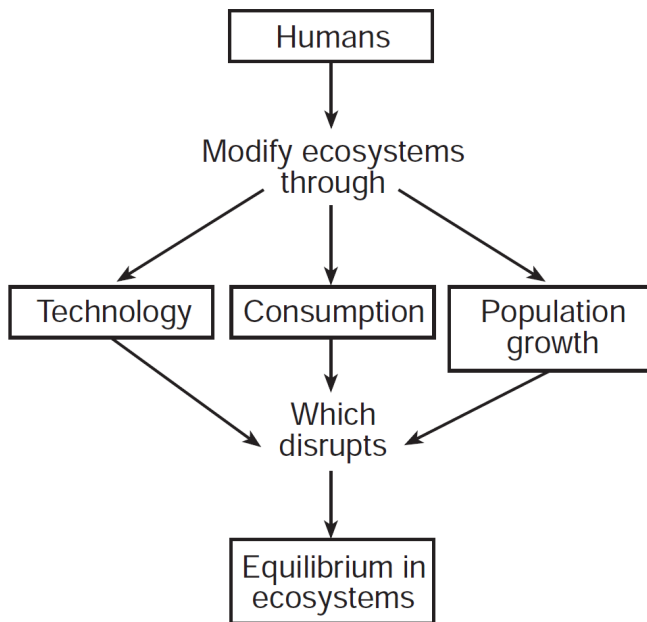
- A) recycle energy
B) recycle nutrients
 C) maintain atmospheric pH
 D) reduce biodiversity

33. Which human activity most directly causes a significant increase in the amount of carbon dioxide in the atmosphere?

- A) growing corn for food
 B) not using products containing plastics
C) driving cars long distances
 D) planting large numbers of trees

Ecology Review

34. Which statement best illustrates a concept represented in the diagram below?



- A) Tsunamis triggered by oceanic earthquakes cause widespread flooding that can lead to large scale environmental destruction.
- B) Annual hunting laws determine the number of deer that can be hunted to ensure population stability.
- C) More individuals are purchasing hybrid cars that use less gasoline and produce less carbon dioxide.
- D) The increased use of electronics has led to increased mining for precious metals and minerals in developing countries.**
35. When humans place grass clippings and other yard waste in landfills, they are most directly interfering with the natural process of
- A) recycling energy
- B) the production of energy
- C) recycling organic compounds**
- D) the production of organic compounds
36. When deciding on new environmental policies and laws, which term is used to describe the comparison between benefits and costs of human activities?
- A) technology **B) trade-off**
- C) climate change D) industrialization

37. When rain forests are cut down, there is a

- A) loss of fossil fuels that could be used by industry
- B) release of excess oxygen to the atmosphere
- C) release of chemicals which cause helpful mutations
- D) loss of genetic material available for research**

Ecology Review

Base your answers to questions 38 through 40 on the information below and on your knowledge of biology.

New Threat to Endangered Sea Turtles



Endangered sea turtles in tropical areas are facing a new threat in the form of changing beach temperatures caused by climate change. The sex of sea turtle hatchlings is determined by the temperature inside the nest. Embryos develop into males when the temperature is approximately 28°C (82°F), whereas female embryos develop at approximately 31°C (88°F). If the temperature inside the nest is between these values, then both male and female turtles are produced.

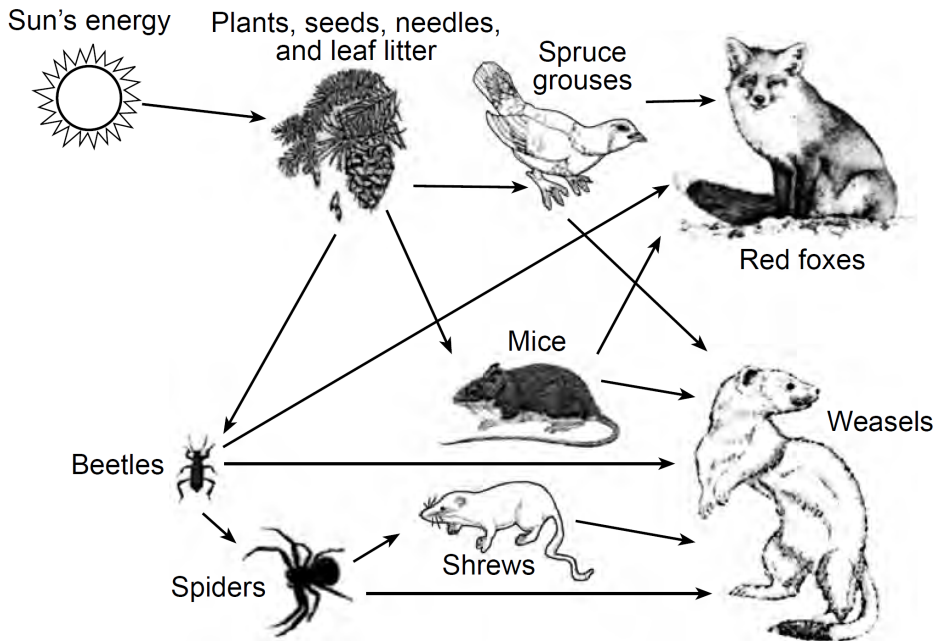
If these endangered sea turtles are going to survive in the long term, we need to protect their nesting habitat, ensure that the potential nest sites have adequate amounts of shade-producing vegetation (such as palm trees) nearby, and ensure that they are not affected by tourist activities in the area.

38. State *one* way that tourist activities in areas where turtles make their nests could have a *negative* impact on the nesting success of the turtles.
 39. Explain how having adequate amounts of shade-producing vegetation nearby, such as palm trees, can affect the nesting success of endangered sea turtles.
 40. Temperatures at beaches where these turtles nest are expected to slowly increase with global climate change. State *one* specific effect that a continuous rise in temperature could have on the sex ratio of the hatchling populations of these sea turtles.
-

Ecology Review

Base your answers to questions 41 through 43 on the food web represented below and on your knowledge of biology. The food web contains some of the organisms found in Glacier National Park.

Glacier National Park Food Web



Source: www.nps.gov

41. Describe how the niche of the mouse population differs from the niche of the shrew population in this ecosystem. Support your answer with information from the food web.
 42. Explain why a major increase in the number of cloudy days that extends over a period of years would be expected to affect the populations of both plants and animals in this ecosystem.
 43. Identify which group of organisms in this food web would contain the greatest amount of stored energy. Support your answer.
-
44. Base your answer on the expression below and on your knowledge of biology.

Think globally, act locally!

This expression has been applied to many ecological problems, such as global warming [global climate change], and air pollution. Choose *one* of these ecological problems and write the name of the problem on your answer sheet. For the problem chosen, state *one* specific "local action" that could be taken.

Problem:

Local action:

Ecology Review

45. Base your answer to the following question on the information below and on your knowledge of biology.

Both food chains and food webs can be used to illustrate relationships between organisms in an ecosystem.

Explain why using a food chain is more limiting than using a food web to show relationships between organisms in an ecosystem.

Answer Key Ecology Review

1. D
 2. C
 3. B
 4. D
 5. C
 6. C
 7. A
 8. B
 9. D
 10. C
 11. C
 12. A
 13. D
 14. C
 15. C
 16. C
 17. C
 18. B
 19. A
 20. D
 21. A
 22. B
 23. B
 24. B
 25. C
 26. B
 27. C
 28. B
 29. A
 30. B
 31. C
 32. B
 33. C
 34. D
 35. C
 36. B
 37. D
 38. — Tourists using the beach could trample on or damage the nests. — Tourists could deliberately damage the nests by collecting the eggs for souvenirs. — If beaches are disturbed to make them nice for the tourists, the nests could be destroyed.
 39. — It is important to keep the nests from getting too hot and perhaps killing all of the eggs before they hatch. — If there are no palm trees to shade the nests, more females than males will hatch. — Without trees, fewer will survive.
 40. — There will be more females hatched than males. — Females will outnumber the males. — The hatchling populations will have almost all (or maybe all) females.
 41. — Shrews are predators of spiders, while mice eat plants. — Mice are herbivores/primary consumers and shrews are carnivores/tertiary consumers. — Mice are food for both weasels and foxes, while shrews are only eaten by weasels. — Mice compete with spruce grouse for food, while shrews compete with weasels for spiders.
 42. (essay)
 43. — The greatest amount of stored energy in this food web would be in the plants because they obtain energy directly from the Sun. — Plants would, since they are the producers/-autotrophs. — Plants, seeds, needles, and leaf litter would have the most energy because they are at the base of the energy pyramid/beginning of food chains.
 44. (essay)
 45. — Food chains only show one specific series of feeding relationships. — Food webs show the feeding relationships more completely. — Food webs show more ways that energy can flow through the ecosystem. — Food webs show that organisms eat more than one type of food.
-

Answer Key

Ecology Review

42. — Both the plants and animals would be negatively affected, since the rate of photosynthesis would slow down with less light from the Sun available, and less food would be available for animals to eat.
— The plant and animal populations would both decrease with less energy available for them because of less light for the plants.
— These organisms would have less food because of less photosynthesis occurring, so there would be fewer of them.
— It would affect both plants and animals negatively, because the plants would receive less light to make food.
44. Global warming/Global climate change
— Ride a bicycle or walk rather than drive car short distances. — Use a car that runs efficiently. — Put on a sweater rather than turning up the heat. — Conserve fuel/electricity. — Recycle rather than burn garbage. — Reduce the burning of fossil fuels.
- Air pollution
— use of solar panels — scrubbers/precipitators on smoke stacks — carpooling — Reduce the burning of fossil fuels.
- Deforestation
— Replace trees that are cut down. — Support the development of green spaces in urban areas.
-