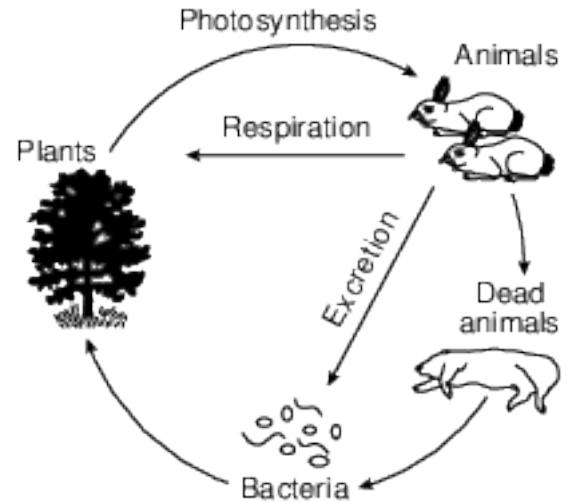


## Ecology

- 1 Scientists have found that although plants require light to carry on photosynthesis, very high levels of sunlight can kill some plants. This illustrates that many biochemical processes may occur
  - (1) more rapidly when temperatures are very high
  - (2) within a specific range of conditions
  - (3) best in the absence of abiotic factors
  - (4) even if homeostasis is disrupted
  
- 2 Wildflowers grow and reproduce during the spring snowmelt in the desert region of Death Valley, California. Which environmental factor would most likely have the greatest influence on these activities?
  - (1) percentage of nitrogen in the atmosphere
  - (2) number of plant species in the area
  - (3) variety of scavengers in the ecosystem
  - (4) amount of time that water is present

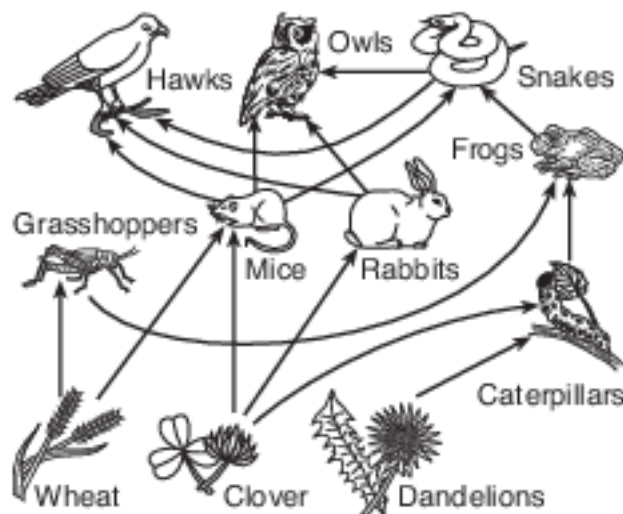
- 3 The diagram below represents various factors in an area.



The diagram best represents

- (1) the recycling of energy in a forest community
- (2) ecological succession after climatic changes
- (3) competition for limited resources in a population
- (4) the flow of materials in a forest community

Base your answers to questions 4 on the diagram below and on your knowledge of biology. The diagram represents a food web in an ecosystem.

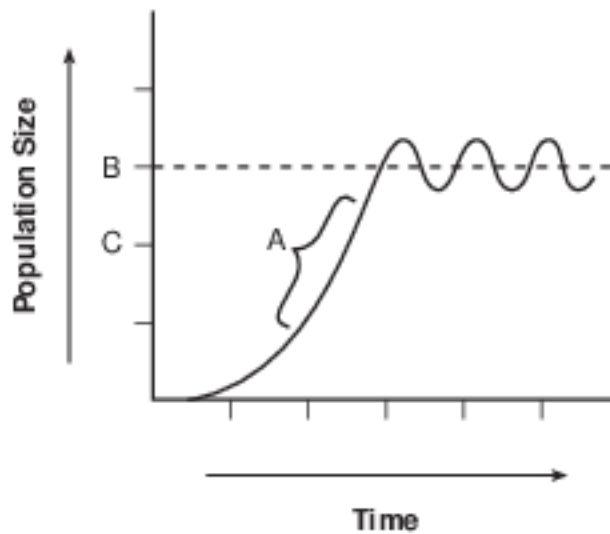


4 Missing from the diagram of this ecosystem are the

- (1) biotic factors and decomposers
- (2) abiotic factors and decomposers
- (3) autotrophs, only
- (4) heterotrophs, only

Base your answers to questions 5 on the graph below and on your knowledge of biology. The graph shows the growth of a population of rabbits in a specific ecosystem.

**Rabbit Population in a Specific Ecosystem**



5 Which environmental factor could have caused the change indicated at A?

- (1) increased predation by herbivores
- (2) increased availability of food
- (3) increased number of decomposers
- (4) increased competition among carnivores

6 Scientists have recently discovered a community of bacteria and clams living under an ice shelf in Antarctica. These organisms live under 600 feet of ice, in the absence of sunlight, and in temperatures considered too cold for most living organisms. The location where these organisms live is unusual because

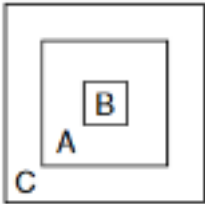
- (1) only biotic factors control the size of the populations
- (2) bacteria and clams are found in the same area
- (3) of the abiotic factors found in their environment
- (4) green plants make energy-rich compounds available

- 7 The chart below shows three ecological terms used to describe levels of organization on Earth.

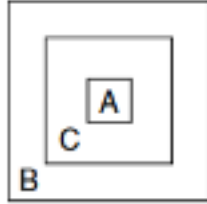
A	ecosystem
B	population
C	biosphere

Which diagram best represents the relationship of these ecological terms?

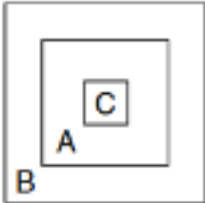
(1)



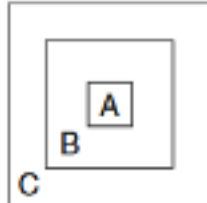
(3)



(2)



(4)



- 8 The organisms in a pond and the physical factors influencing them best describe

- (1) a population                      (3) a biosphere  
 (2) an ecosystem                    (4) a food chain

- 9 Forests, mountains, rivers, and marshes are examples of the wide variety of ecosystems in New York State. The diversity of these ecosystems is most likely the result of
- (1) the variety of abiotic conditions in these regions
  - (2) interactions between producers and decomposers
  - (3) increased efforts to protect endangered species
  - (4) a lack of competition between the heterotrophs living there

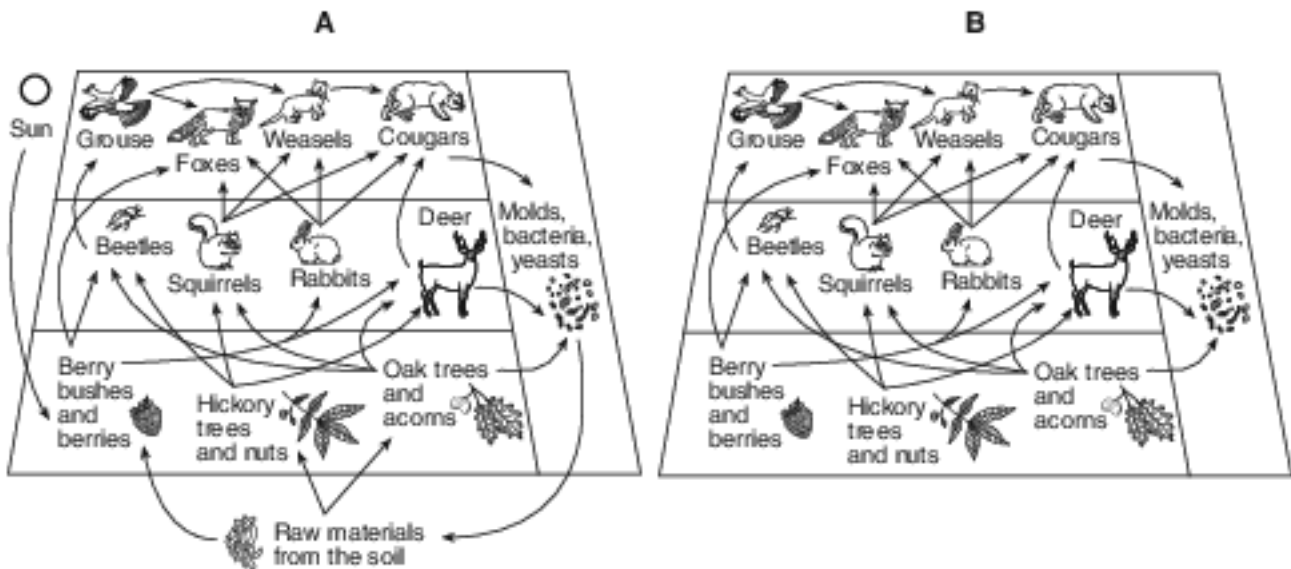
- 10 Which human activity most directly causes a significant increase in the amount of carbon dioxide in the atmosphere?

- (1) growing corn for food
- (2) not using products containing plastics
- (3) driving cars long distances
- (4) planting large numbers of trees

- 11 In a sewage treatment facility, an optimal environment is maintained for the survival of naturally occurring species of microorganisms. These organisms can then break the sewage down into relatively harmless wastewater. For these microorganisms, the wastewater facility serves as

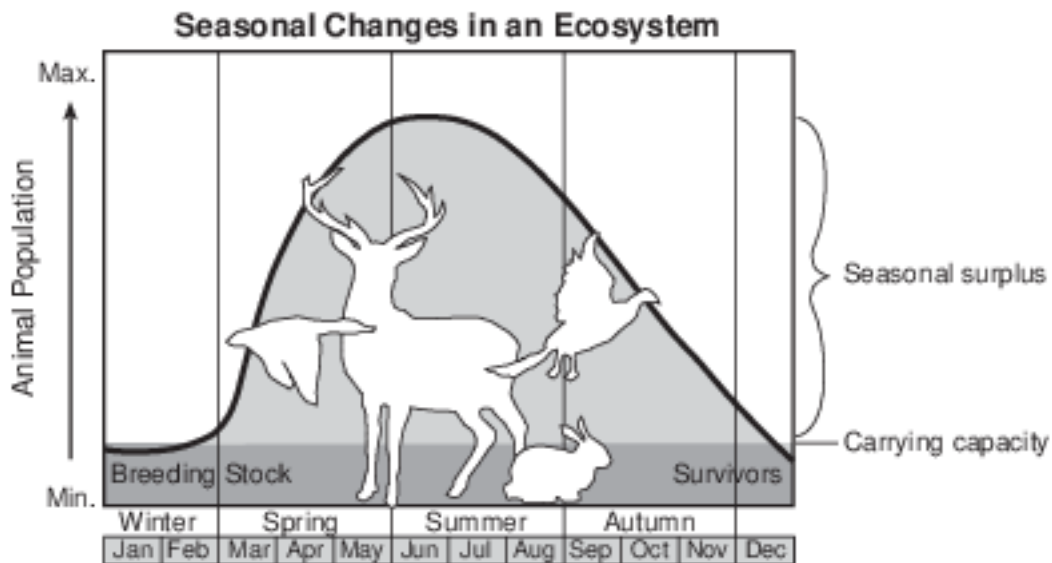
- (1) its carrying capacity    (3) an ecosystem
- (2) a food chain              (4) an energy pyramid

Base your answers to questions 12 on the diagrams below and on your knowledge of biology. The diagrams represent how various populations interact in a forest environment.



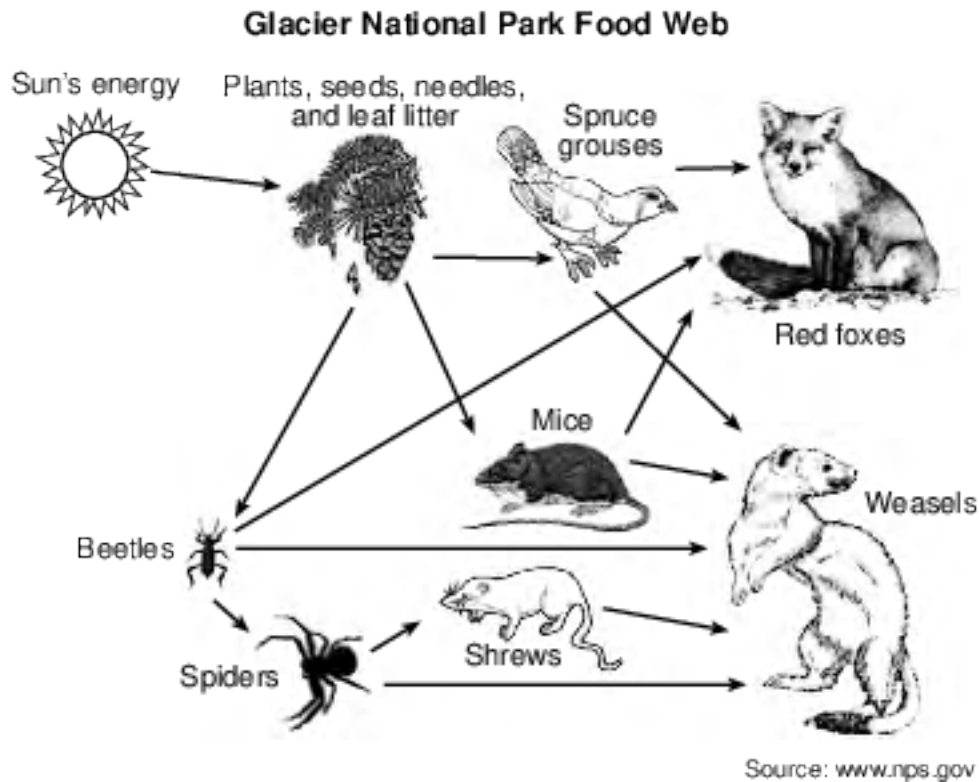
12 If this forest community experienced a severe lack of rain throughout the spring and summer seasons, state what effect this drought could have on the grouse population. Support your answer. [1]

Base your answers to questions 13 on the chart below and on your knowledge of biology. The chart shows seasonal changes in an ecosystem and the overall carrying capacity of the ecosystem.



13 State why the populations decrease between July and December. [1]

Base your answers to questions 14 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.



- 14 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. [1]
  
- 15 Recently, the bison population in Yellowstone National Park declined significantly. This was due in part to a particularly harsh winter. State one reason why a harsh winter would have this negative effect on the bison population. [1]

## Answer Keys

1 2

2 4

3 4

4 2

5 2

6 3

7 1

8 2

9 1

10 3

11 3

12 Allow 1 credit for stating what effect this drought could have on the grouse population and for

- supporting the answer. Acceptable responses include, but are not limited to:
- — Lack of rain could cause plants to die off, decreasing the food available for the beetles,
- which would die off, causing the grouse population to also decrease.

13 Allow 1 credit. Acceptable responses include, but are not limited to:

- — There is not enough food, so some die of starvation.
- — disease
- — Predators kill them.
- — hunting
- — colder weather
- — They are over the carrying capacity.
- — increased competition
- — They migrate.

14 Allow 1 credit. Acceptable responses include, but are not limited to:

- — 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.

15 Allow 1 credit. Acceptable responses include, but are not limited to:

- — The young and old bison are more likely to perish during a harsh winter.
- — More energy is used by the bison to keep warm.
- — Less food is available.