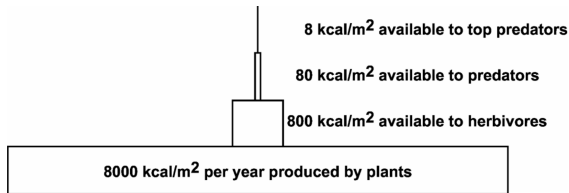


Ecology Practice Questions

Name: _____

Date: _____

1. The diagram below is an energy pyramid showing the amount of energy available at each trophic level. Each level receives approximately 10% of the energy from the level below.

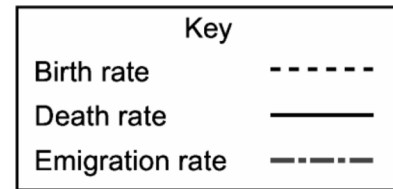
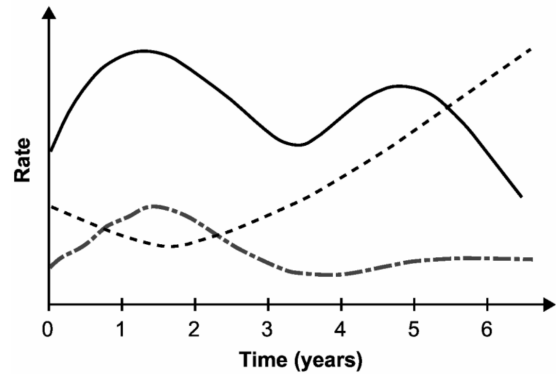


Which of the following statements best explains the difference in the amount of energy available at each trophic level?

- Higher trophic levels contain 90% more organisms than lower levels.
- Producers pass 90% of the energy from sunlight to the next level.
- Life functions at each trophic level consume 90% of the remaining energy.
- Organisms in lower trophic levels digest food 90% faster than those in the middle levels.

2. An ecologist studied a rare bird species within a regional wildlife preserve for several years. The graph shows the data the ecologist collected on the birth rate, death rate, and emigration rate for the bird species.

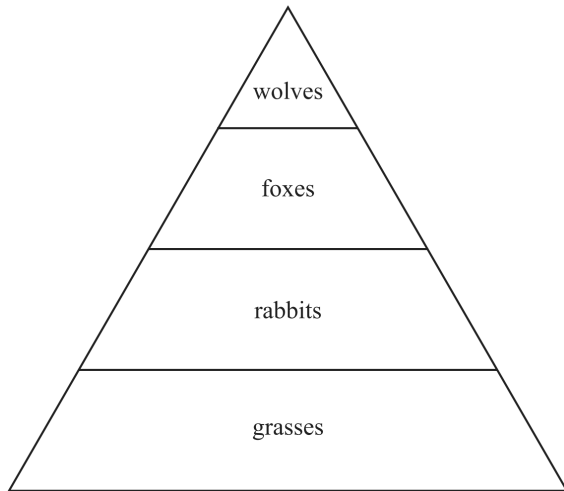
Population Factors Affecting a Rare Bird Species in a Regional Preserve



During which time period did the bird population experience the largest decline?

- Between Years 0 and 1
- Between Years 1 and 2
- Between Years 3 and 4
- Between Years 4 and 5

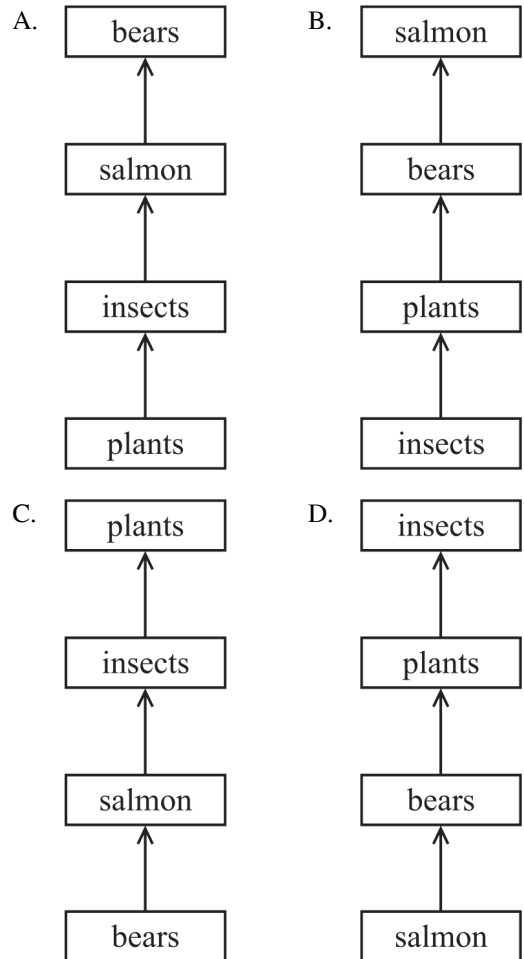
3. The picture below shows an energy pyramid.



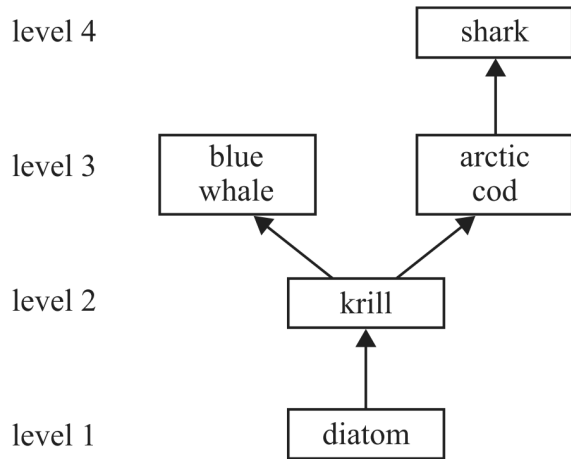
What will *most likely* happen to the foxes and the wolves if the rabbits are removed?

- A. The foxes will eat more wolves.
- B. The foxes will eat fewer wolves.
- C. There will be more foxes and wolves.
- D. There will be fewer foxes and wolves.

4. Which model *correctly* shows energy flow in a food chain?



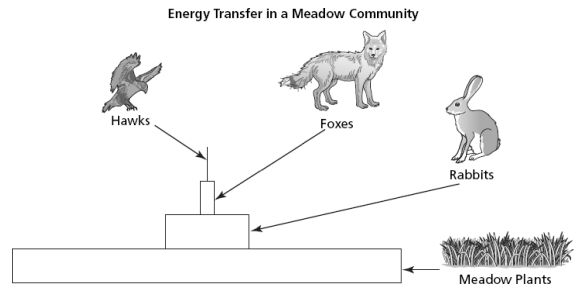
5. A marine food web is shown in the diagram below.



Which organism below belongs in level 3 of this marine food web?

- A. salmon
- B. zooplankton
- C. sea alga
- D. polar bear

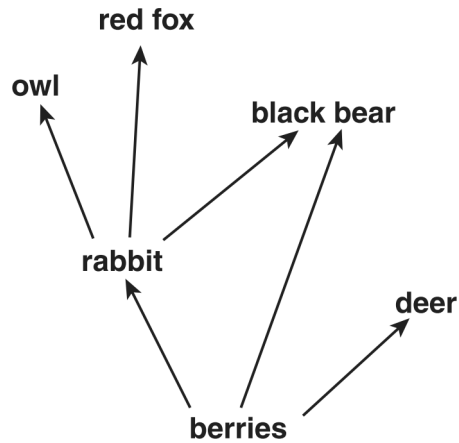
6. The picture below shows the energy flow through a meadow community.



Which statement *best* describes the flow of energy as it passes through the organisms in the pyramid?

- A. Energy flows through the organisms from bottom to top and increases at each level.
- B. Energy flows through the organisms from bottom to top and decreases at each level.
- C. Energy flows through the organisms from top to bottom and increases at each level.
- D. Energy flows through the organisms from top to bottom and decreases at each level.

7. The diagram below shows a simple food web.



Which animal is classified as an omnivore?

- A. red fox B. deer
C. black bear D. rabbit
8. If animals eat plants to get energy, where do plants get their energy?
- A. Soil B. Water C. Wind D. Sun
9. Lightning from a thunderstorm strikes a tree that falls to the forest floor and dies. During the next few years the dead tree undergoes many changes.
- What organisms are *most likely* responsible for the biological and chemical changes to the tree?
- A. consumers B. decomposers
C. predators D. producers

10. Use the information and the figure below to answer the following question(s).

Black skimmers are water birds that live along coastal beaches, bays, estuaries, and marshes. They fly just above the surface of the water using their lower jaw to catch small fish, shrimp, and other small crustaceans.

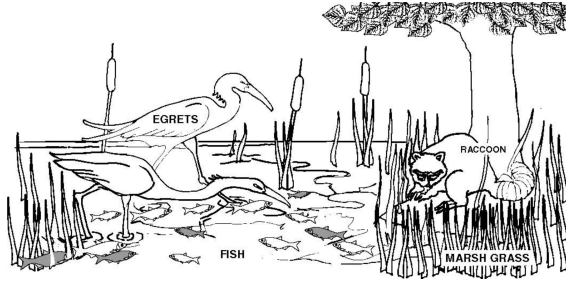


These birds nest in simple, unlined depressions in the sand. Scientists have observed a decline in the number of nests. Some causes of this decline include a lack of suitable nesting sites, beach erosion, and human disturbances.

When people approach their nests, the birds become aggressive and chase away intruders. Other animals, like crows, will take advantage of the unprotected nests and feed on the eggs.

- A continued decrease in black skimmer populations will *most likely* lead to
- A. a decrease in scavenger populations
B. an increase in producer populations
C. a decrease in decomposer populations
D. an increase in prey animal populations

11.



Which of the following organisms in the pond scene shown above has the *greatest* biomass?

- A. Raccoon
- B. Egrets
- C. Fish
- D. Marsh grass

12. How do nitrogen-fixing bacteria help cycle nitrogen through ecosystems?

- A. They release nitrogen into the atmosphere when they replicate their DNA.
- B. They convert sunlight into chemical energy which is then stored in the nitrogen.
- C. They convert ammonia from animal feces and urine into forms that plants can use.
- D. They capture nitrogen from the atmosphere and convert it into forms that plants can use.

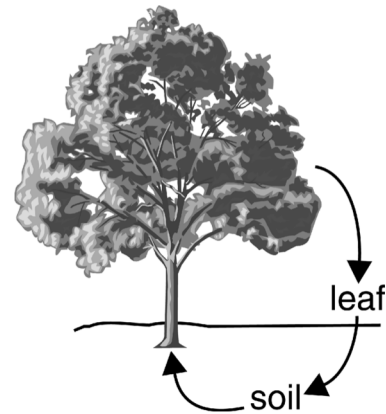
13. Complete burning of plant material returns carbon primarily to the

- A. herbivores.
- B. water.
- C. vegetation.
- D. atmosphere.

14. During periods of increased global temperatures, which of the following is *most* likely to occur?

- A. a decrease in atmospheric CO₂
- B. an increase in atmospheric CO₂
- C. a decrease in earthquakes
- D. an increase in earthquakes

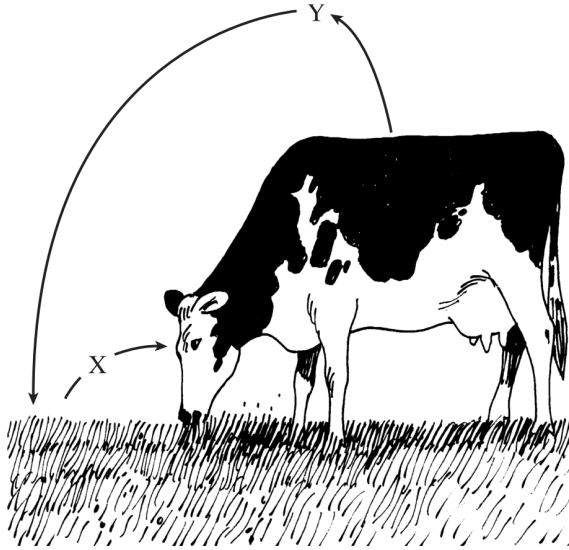
15. Use the picture below to answer the following question(s).



The picture represents the flow of a nutrient such as phosphorus in a forest. Which organism would make that nutrient available in the soil?

- A. cricket
- B. woodpecker
- C. squirrel
- D. mushroom

16. The illustration below shows part of the carbon cycle.



At position Y, carbon is *most likely* to be in which of the following forms?

- A. protein B. carbon solid
C. carbohydrate D. carbon dioxide
17. The natural cycling of oxygen between organisms and their environment is *most* directly accomplished through which of the following pairs of processes?
- A. fermentation and oxidation
B. transpiration and evaporation
C. precipitation and condensation
D. photosynthesis and respiration

18. In one of the steps of the carbon cycle, a person exhales a molecule of carbon dioxide (CO_2) into the atmosphere. Which of the following is *most likely* to happen next to the atom of carbon in this molecule?

- A. It may be used as part of a sugar in a plant.
B. It may become part of a protein in an animal.
C. It may be consumed as a fossil fuel is burned.
D. It may be decomposed into carbon and oxygen by a bacterium.

19. Fertilizers can enable farmers to grow the same crop in a field for several years in a row. Farmers who use less fertilizer often rotate their crops by planting the crop one year and legumes, such as beans and clover, the following year.

Fertilizer use and crop rotation with legumes both increase the availability of which of the following nutrients in soil?

- A. calcium B. nitrogen
C. oxygen D. protein

20. Which of the following explains why legume plants are less likely than other terrestrial plants to experience nitrogen limitation?

- A. Legume plants need less nitrogen than other plants do.
- B. Legume plants have nitrogen-fixing bacteria on their roots.
- C. Legume plants catch insects to supply themselves with nitrogen.
- D. Legume plants can absorb nitrogen directly from the atmosphere.

21. In July, a student tested the soil in two plots and calculated the concentration of nitrogen compounds present in each plot. The student then planted 20 seedlings in the first plot and allowed them to grow. Nothing was planted in the second plot. The student tested the soil in both plots again after one month. The concentration of nitrogen compounds had decreased in the first plot but had remained the same in the second plot.

Which of the following *best* explains the decrease in nitrogen compounds in the first plot?

- A. The nitrogen compounds had broken down into elements.
- B. The nitrogen compounds were absorbed by the seedlings for their growth.
- C. The nitrogen compounds escaped through air pockets created by the seedlings' roots.
- D. The nitrogen compounds had evaporated because of the warm summer temperatures.

22. Nitrogen compounds are a part of all organisms. What happens to the nitrogen in an organism after it dies?

- A. It is destroyed by decomposition.
- B. It is recycled and used by other organisms.
- C. It remains trapped in the organism's tissues.
- D. It is all used up by the time the organism dies.

23. Land animals need nitrogen to survive, but they cannot use the nitrogen gas found in the air they breathe. How do organisms take in the nitrogen they need to survive?

- A. By exercising
- B. By eating food
- C. By drinking water
- D. By swimming in water

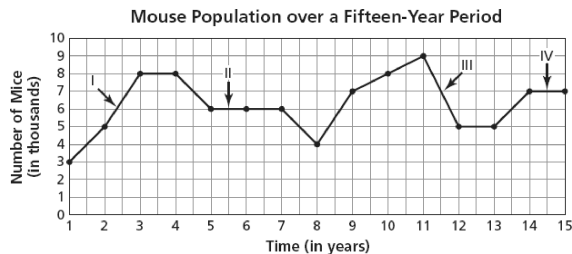
24. Which statement correctly describes how nitrogen in the soil returns to the atmosphere?

- A. Soil bacteria convert nitrates into nitrogen gas.
- B. Decomposers directly convert ammonium into nitrogen gas.
- C. Plants assimilate nitrites and convert them into nitrogen gas.
- D. Nitrogen-fixing bacteria in plant roots convert nitrates into nitrogen gas.

25. In a desert environment, cactus wrens often build their nests in cholla cacti to avoid predators. This behavior does not hurt the cacti. Which type of relationship do cactus wrens and cholla cacti demonstrate?

- A. competitive
- B. commensalism
- C. mutualism
- D. parasitism

26. The graph below shows the population of mice living in a certain area over a fifteen-year period.



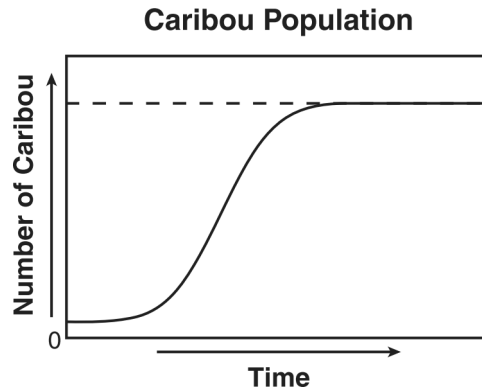
Which numeral on the graph points to a time when the birth rate exceeded the death rate of the mice?

- A. I
- B. II
- C. III
- D. IV

27. Salt concentration, water temperature, plankton, and the whale shark might all be used in a description of an ocean

- A. climate.
- B. food web.
- C. ecosystem.
- D. population.

28. The graph below shows changes in a caribou population over time.



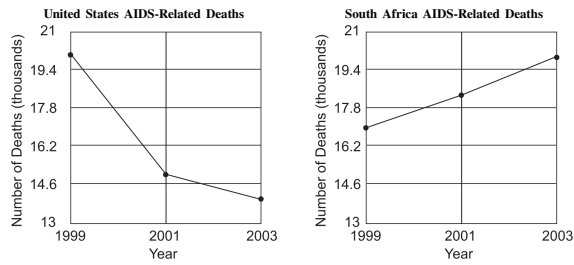
Based on the graph, which of the following is a possible explanation for the stabilization of the caribou population?

- A. an equal number of deaths and births
- B. an unequal number of deaths and births
- C. an equal number of immigrants and births
- D. an unequal number of immigrants and deaths

29. Rabbits introduced into Australia over 100 years ago have become a serious pest to farmers. Rabbit populations increased so much that they displaced many native species of plant eaters. What is the *most* logical explanation for their increased numbers?

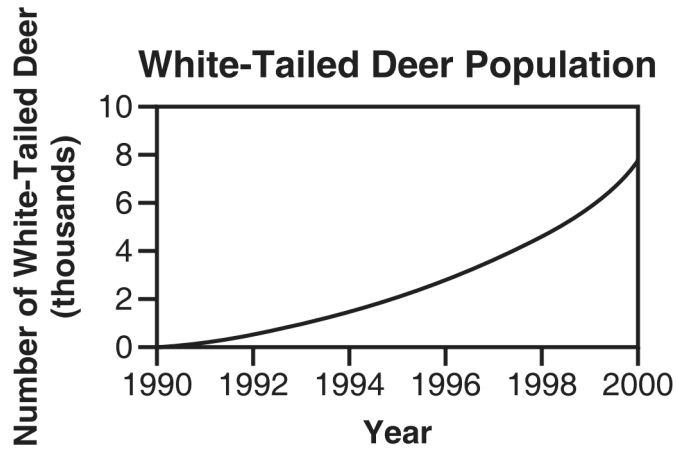
- A. Rabbits have a high death rate.
- B. There are few effective predators.
- C. Additional rabbit species have been introduced.
- D. There is an increase in rabbit competitors.

30. The graphs below show the annual number of AIDS deaths in the United States and in South Africa from 1999–2003.

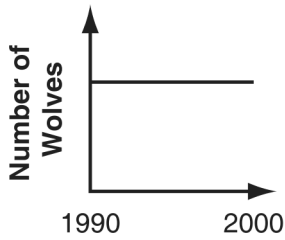
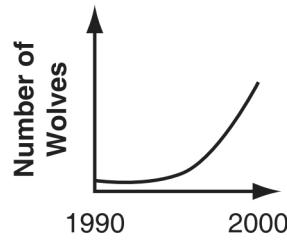
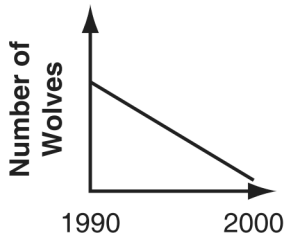
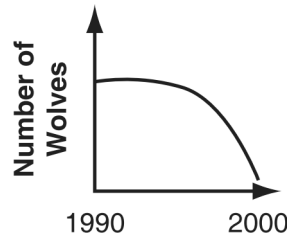


What conclusion is *best* supported by the data in the graphs?

- A. AIDS has been cured in the United States but not in South Africa.
- B. AIDS has caused a greater population decline in South Africa than it has in the United States.
- C. The number of AIDS deaths in each country is solely responsible for the population growth rate in each country.
- D. The population in South Africa has increased regardless of AIDS, whereas the United States population has decreased as a result of AIDS.



The graph above shows how a white-tailed deer population recovered over a ten-year period after a population crash. Wolves in the same area feed primarily on deer. Which graph shows the *most likely* change in wolf population for the same ten-year period?

A. **Wolf Population**B. **Wolf Population**C. **Wolf Population**D. **Wolf Population**

32. What do scientists mean when they refer to a *population*?
- A. all the organisms in an ecosystem
 - B. all the species that share similar anatomical features
 - C. all the animals that acquire resources through similar methods
 - D. all the interbreeding members of a certain species in an ecosystem

33. Which relationship is mutualistic?
- A. an insect that lives and feeds on the body of an alligator
 - B. an ant that lives on a plant and defends the plant from other insects
 - C. a bird that migrates to follow the movements of the butterflies that it eats
 - D. a deer that eats one kind of plant, which allows another kind of plant to grow in its place

34. Which of the following is *always* a result of immigration into a population?
- A. New individuals are added to the population.
 - B. Some individuals are forced to leave the population.
 - C. The survival rate of the individuals in the population increases.
 - D. The genetic diversity among the individuals in the population decreases.

35. Which of the following *most likely* results in a decrease in a blackbird population?
- A. birth
 - B. emigration
 - C. immigration
 - D. mutualism

36. Brown tree snakes were accidentally carried to the island of Guam in the cargo bays of military planes after World War II. Brown tree snakes prey upon birds. There are no natural predators of brown tree snakes on Guam.

Which of the following *most likely* happened as a result of the arrival of the brown tree snakes on Guam?

- A. Forest biodiversity increased.
- B. Many bird populations disappeared.
- C. Immigration of new species of birds decreased.
- D. All reptile species experienced increases in population size.

37. At the end of 2009, there were 240 individuals in a particular coyote population. In 2010, scientists monitoring the population recorded 85 births and 68 deaths.

A student used this data to calculate the size of the coyote population at the end of 2010. The student's calculation is shown below.

$$240 + 85 - 68 = 257$$

The actual number of coyotes at the end of 2010 was not 257; it was 294. Which of the following statements explains the difference between the calculated and actual population sizes?

- A. The calculation does not include coyote immigration and emigration.
- B. The calculation does not consider the life expectancy of the average coyote.
- C. The calculation does not consider the average number of coyote pups in a litter.
- D. The calculation does not include changes in the number of breeding adult coyotes.

38. Clams, oysters, and mussels eat plankton filtered from water.

How would clams, oysters, and mussels *most likely* be affected if the amount of plankton in a large body of water was significantly reduced?

- A. They would increase in number.
- B. They would find a new food source.
- C. They would become prey to other animals.
- D. They would compete for a limited food source.

39. Use the information and the table below to answer the following question(s).

A scientist studied iguanas on the Galapagos Islands. He discovered two species of iguanas that live in different habitats and display very different behaviors. His observations are listed in the table below.

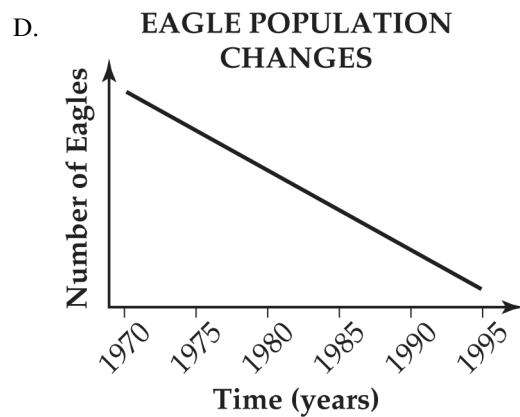
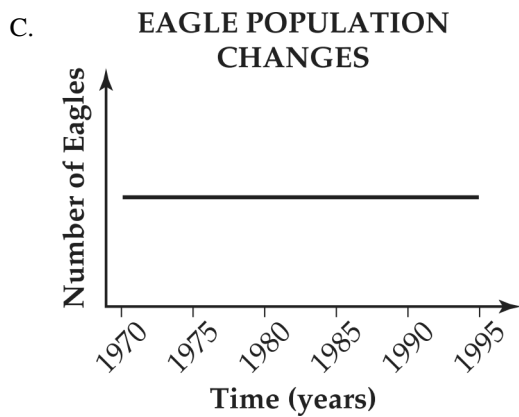
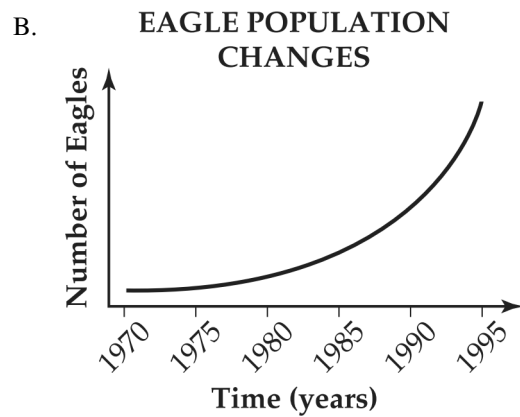
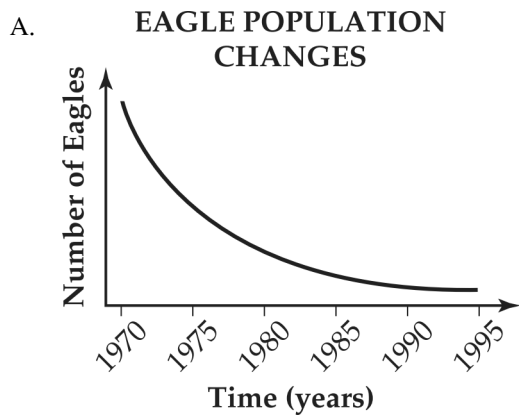
OBSERVATIONS OF TWO SPECIES OF IGUANAS	
Marine Iguana	Land Iguana
<ul style="list-style-type: none"> • spends most of its time in the ocean • is never found more than 10 yards from the shore • eats mainly marine algae 	<ul style="list-style-type: none"> • spends most of its time on land • is found far inland • eats cacti and other land plants

Visiting sailors brought goats to the Galapagos Islands. The goats competed with native animals for food and shelter. Which of these was probably *not* affected by the goats?

- A. food supply
- B. spread of disease
- C. natural disasters
- D. stability of the ecosystem

40. The pesticide DDT was used to kill mosquitoes for many years. DDT entered bodies of water, moved up the food chain, and built up in the tissues of fish. When female bald eagles ate these fish, they produced eggs with very thin shells. The eggs broke when the eagles sat on their nests. The U.S. government banned the use of DDT in 1972.

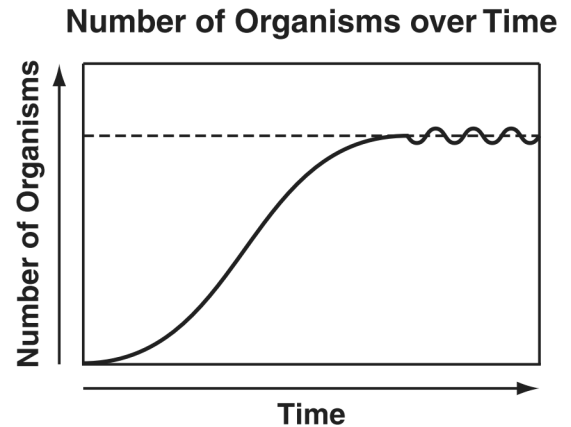
Which of these graphs *most likely* shows how the ban of DDT affected the bald eagle population?



41. A new species is introduced into an area. This can have harmful effects on species already inhabiting the area. The harmful effects are *most likely* a result of

- A. succession
- B. mutualism
- C. competition
- D. commensalism

42. The graph below shows the number of organisms in an ecosystem over time.



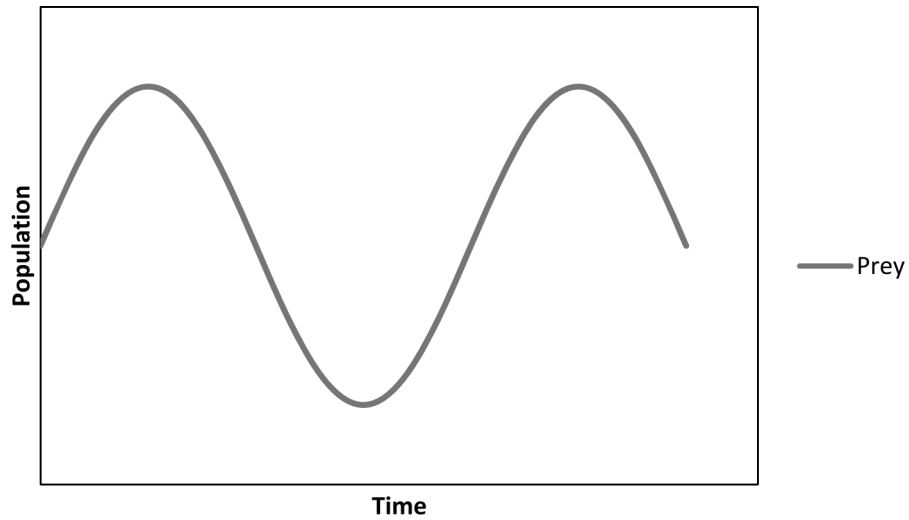
Which biological concept is *best* illustrated by the graph?

- A. natural selection
- B. carrying capacity
- C. geographic isolation
- D. predator-prey relationships

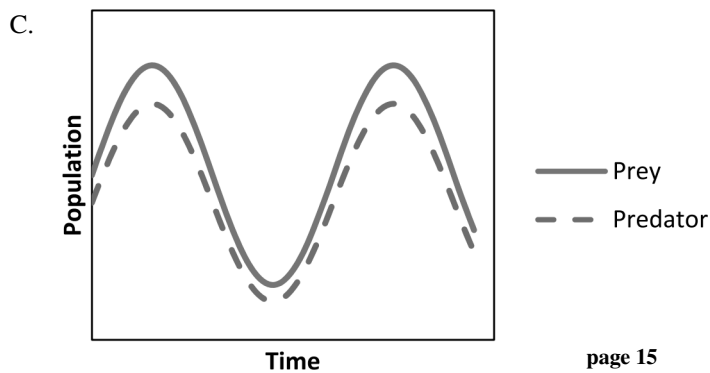
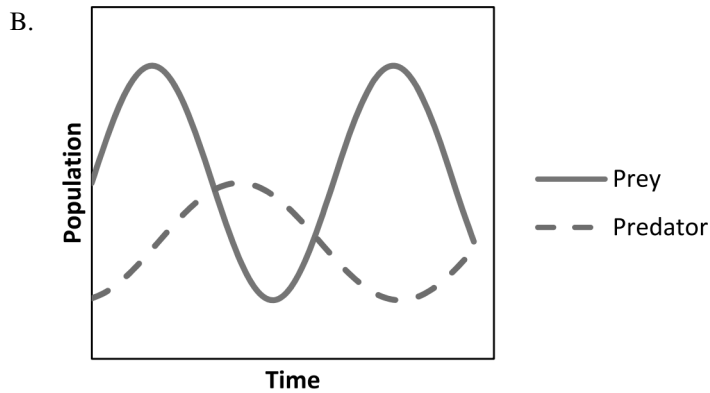
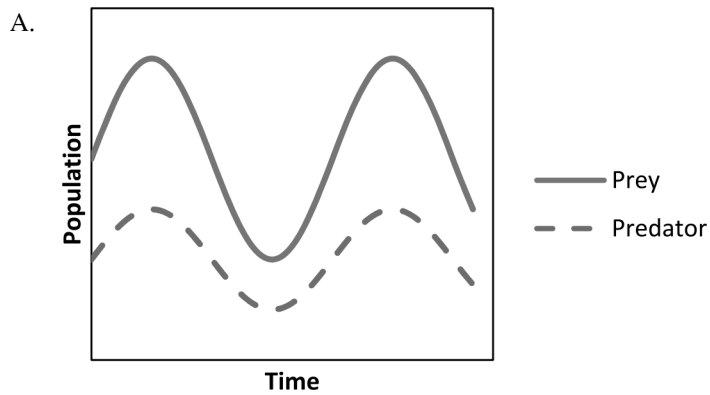
43. The concentration of chemical food contaminants is higher in birds of prey than in many of the individual organisms that they eat. Which of the following statements *best* explains the reason for the higher concentration of food contaminants in birds of prey?

- A. Birds of prey store more of the food they eat.
- B. Birds of prey catch animals with chemical contaminants more easily.
- C. Only birds of prey store chemical contaminants.
- D. Chemical contaminants are stored and magnified in organisms higher up the food chain.

44. Your teacher gives you 10 years of population data for two animal species in West Virginia. You learn the species have a predator-prey relationship. Your teacher instructs you to develop a model of the population changes. You use your computer to begin creating the graph shown below.



Which graph below correctly adds the predator population?



45. Usable nitrogen is released into soil from animal wastes by the breakdown of—
- A. plant proteins.
 - B. water.
 - C. ammonia.
 - D. sugar molecules.

Ecology Practice Questions 05/15/2015

- | | |
|-----------------------|-----------------------|
| 1.
Answer: C | 21.
Answer: B |
| 2.
Answer: B | 22.
Answer: B |
| 3.
Answer: D | 23.
Answer: B |
| 4.
Answer: A | 24.
Answer: A |
| 5.
Answer: A | 25.
Answer: B |
| 6.
Answer: B | 26.
Answer: A |
| 7.
Answer: C | 27.
Answer: C |
| 8.
Answer: D | 28.
Answer: A |
| 9.
Answer: B | 29.
Answer: B |
| 10.
Answer: D | 30.
Answer: B |
| 11.
Answer: D | 31.
Answer: B |
| 12.
Answer: D | 32.
Answer: D |
| 13.
Answer: D | 33.
Answer: B |
| 14.
Answer: B | 34.
Answer: A |
| 15.
Answer: D | 35.
Answer: B |
| 16.
Answer: D | 36.
Answer: B |
| 17.
Answer: D | 37.
Answer: A |
| 18.
Answer: A | 38.
Answer: D |
| 19.
Answer: B | 39.
Answer: C |
| 20.
Answer: B | 40.
Answer: B |

41.
Answer: C

42.
Answer: B

43.
Answer: D

44.
Answer: B

45.
Answer: C