

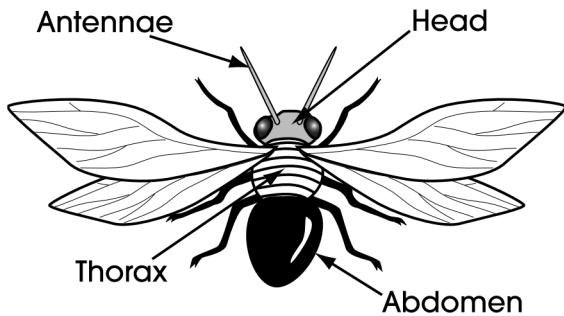
1. In an environment, barriers prevent an organism from entering other environments. This phenomenon illustrates the concept of
- A. punctuated equilibrium
  - B. geographic isolation
  - C. genetic variation
  - D. natural selection

2. The chart below is a taxonomic key for the fictitious insect genus *Problematica*.

**Characteristics of the Genus *Problematica***

1	Thorax and abdomen entirely black Thorax striped and abdomen black	<i>Problematica alva</i> Go to 2
2	Antennae curled Antennae straight	<i>Problematica brancus</i> Go to 3
3	Wings longer than body Wings shorter than body	<i>Problematica cantrellis</i> Go to 4
4	Wings white Wings black	<i>Problematica differensis</i> <i>Problematica fortunatas</i>

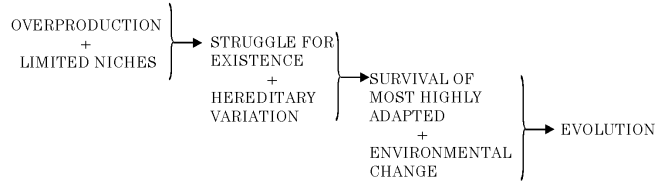
A student has been asked to identify the following insect.



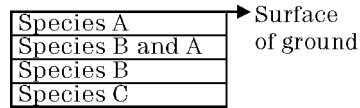
To which species does the insect belong?

- A. *Problematica alva*
  - B. *Problematica brancus*
  - C. *Problematica cantrellis*
  - D. *Problematica differensis*
3. In future generations, the frequency of a mutant gene may tend to increase. This would occur in a given environment if the new trait has
- A. the ability to form a fossil
  - B. a high survival value
  - C. a common ancestry
  - D. no advantage in competition

4. Which theory is best illustrated by the flow chart shown?



- A. cell theory
  - B. theory of acquired characteristics
  - C. use and disuse theory
  - D. theory of natural selection
5. The diagram shown represents a section of undisturbed layers of sedimentary rock in New York State and shows the location of fossils of several closely related species. According to currently accepted evolutionary theory, which is the most probable assumption about species A, B and C?



- A. Species B is more abundant than species C.
  - B. Species C existed before species B.
  - C. Species A and B are genetically identical.
  - D. Species B descended from species A.
6. The table below shows the classifications of four animals.

Animal Classification				
Animal	Q	R	S	T
Kingdom	Animalia	Animalia	Animalia	Animalia
Phylum	Chordata	Chordata	Chordata	Chordata
Class	Mammalia	Mammalia	Mammalia	Mammalia
Order	Carnivora	Rodentia	Rodentia	Carnivora
Family	Canidae	Muridae	Muridae	Felidae
Genus and Species	<i>Canis familiaris</i>	<i>Mus musculus</i>	<i>Mesocricetus auratus</i>	<i>Felis sylvestrus</i>

According to their classification, which of the following animals are most closely related?

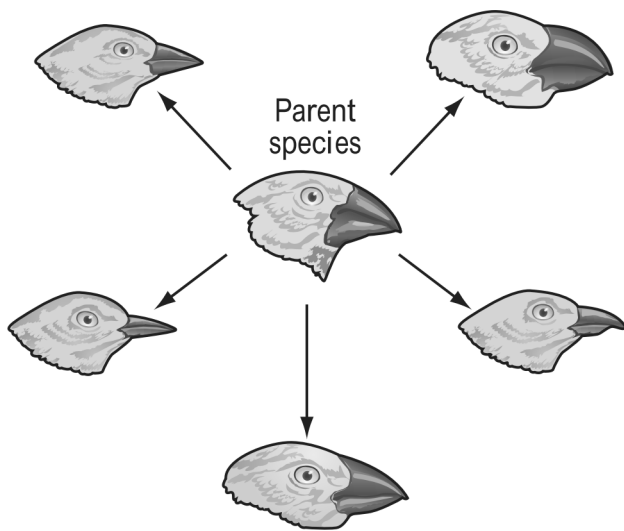
- A. Q and R
- B. S and T
- C. Q and T
- D. R and S

7. According to this information, the closest evolutionary relationship most likely exists between the

- A. human and the chimpanzee
- B. human and the gorilla
- C. chimpanzee and the gorilla
- D. horse and the zebra

Species	Sequence of amino acids in the same part of the the hemoglobin molecules
Human	Lys-Glu-His-Iso
Horse	Arg-Lys-His-Lys
Gorilla	Lys-Glu-His-Lys
Chimpanzee	Lys-Glu-His-Iso
Zebra	Arg-Lys-His-Arg

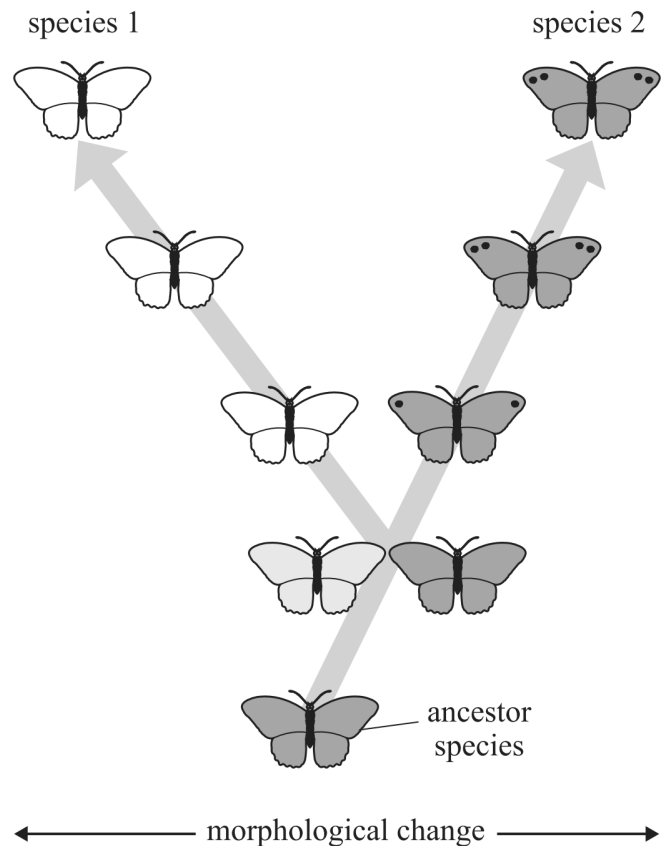
8. The diagram below shows the beaks of five species of birds that developed over time from one parent species. The five species of birds can be found living in the same area.



Which of the following *best* explains why the beak shape of each species of bird developed differently?

- A. Each beak shape helps the birds to produce different songs.
  - B. Each beak shape is an adaptation to a specific source of food.
  - C. Each beak shape is designed to construct a different type of nest.
  - D. Each beak shape helps protect the birds from a different predator.
9. The evolution of new insect populations that are resistant to chemical insecticides illustrates
- A. biological control
  - B. use and disuse
  - C. natural selection
  - D. low survival value

10. The illustration below shows the morphological change of two species.



Which statement explains why species 1 and species 2 are different?

- A. An individual changed itself to suit the environment.
- B. Natural selection can cause gradual speciation changes.
- C. Interbreeding of species 2 results in no genetic mutations.
- D. Extinction of ancestor species occurs as a result of interbreeding.

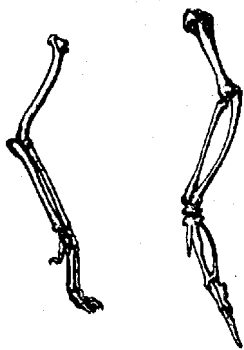
11. How is natural selection in the evolution of long necks in giraffes *best* explained?
- Shorter-necked giraffes were killed by long-necked giraffes.
  - Giraffe necks grew longer because of the bone structure of the animals.
  - Giraffes with longer necks survived because they were better suited to the environment.
  - Long-necked giraffes mated only with other long-necked giraffes.
12. The table below shows features of four different organisms.

Comparison of Four Organisms

Feature	Organism W	Organism X	Organism Y	Organism Z
Number of cells	Many	One	One	Many
Cells have nuclei	Yes	No	Yes	Yes
Cells have walls	Absent	Present	Absent	Present
Does photosynthesis	No	No	No	No
Does respiration	Yes	Yes	Yes	Yes
Type of reproduction	Sexual	Asexual	Asexual	Sexual
Can move about	Yes	Yes	Yes	No

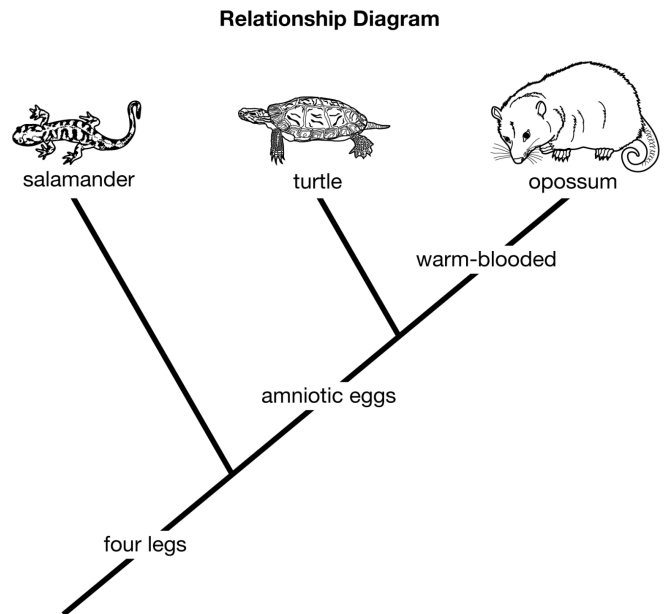
Which organism is *least* related to the others?

- Organism W
  - Organism X
  - Organism Y
  - Organism Z
13. The diagram shows the bones in an appendage of a cat and in an appendage of a bird. The similarities between these appendages suggest that cats and birds



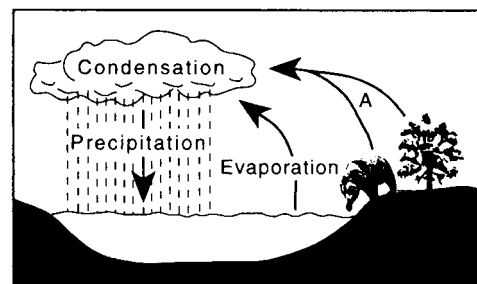
- possess the same number of chromosomes
- evolved from a common ancestor
- evolved gradually over a long period of time
- occupy the same habitat

14. Use the relationship diagram below to answer the question.



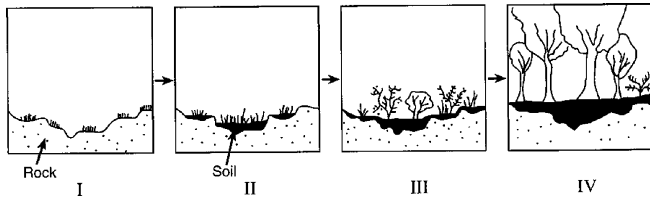
Which statement most accurately describes a relationship between two animals in the relationship diagram?

- The turtle and opossum have amniotic eggs.
  - The turtle and salamander have amniotic eggs.
  - The turtle and opossum are warm-blooded.
  - The turtle and salamander are warm-blooded.
15. In the diagram shown, which processes are most closely associated with the arrows labeled A?



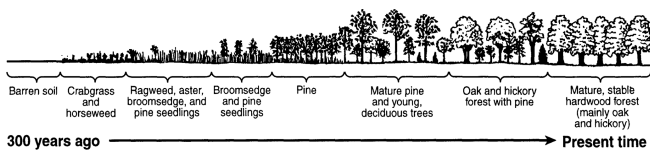
- runoff and respiration
- photosynthesis and decomposition
- respiration and transpiration
- nitrogen fixation and synthesis

16. Base your answer(s) to the following question(s) on the diagrams below of four stages of a biological process and on your knowledge of biology.



What would most likely be the predominant lifeform found in stage 1?

- A. ferns  
B. tracheophytes  
C. mushroom  
D. pioneer species
17. Which biome is characterized by warm temperatures, an abundance of snakes, monkeys, and large cats, and over 80 inches of annual rain fall evenly distributed with no well-defined dry season?
- A. taiga  
B. tundra  
C. tropical rain forest  
D. temperate deciduous forest
18. Base your answer(s) to the following question(s) on the diagram below, which shows the sequence of plant communities that have occupied land that was left barren 300 years ago, and on your knowledge of biology.

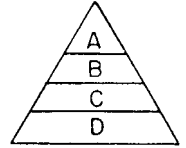


In which biome would this sequence of plant communities most likely be found?

- A. taiga  
B. tundra  
C. tropical rain forest  
D. temperate deciduous forest

19. Which pyramid level contains the greatest amount of stored energy?

A. A B. B C. C D. D



20. The most likely result of a group of squirrels relying on limited resources would be

- A. an increase in the number of squirrels  
B. competition between the squirrels  
C. increased habitats for the squirrels  
D. a greater diversity of food for the squirrels

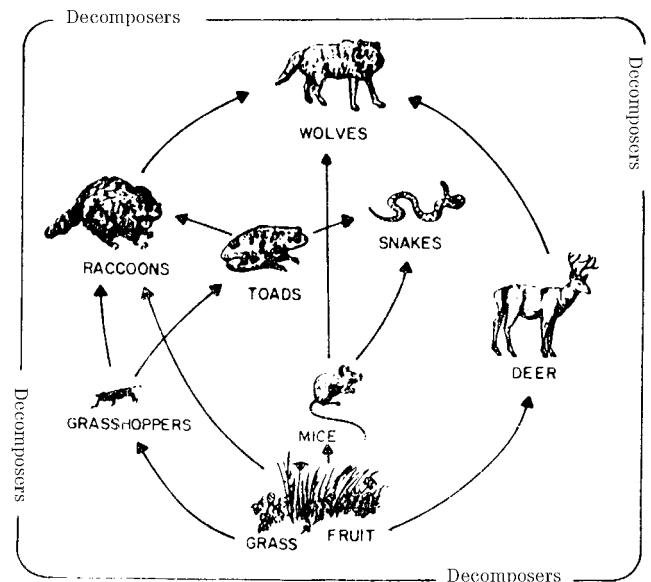
21. An incomplete food chain is shown

algae → minnow → lake trout → X

Which organism could be represented by letter X?

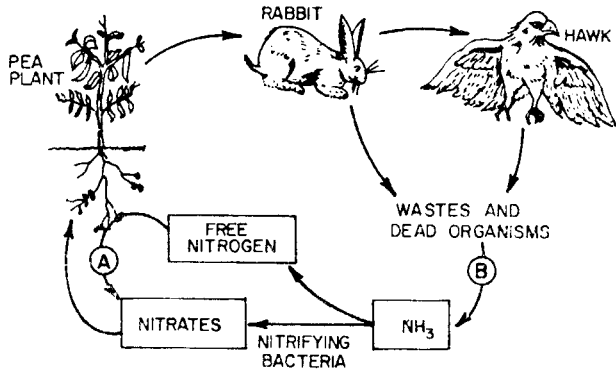
- A. lobster B. jellyfish C. human D. robin

22. Which food chain sequence can be found in this meadow?



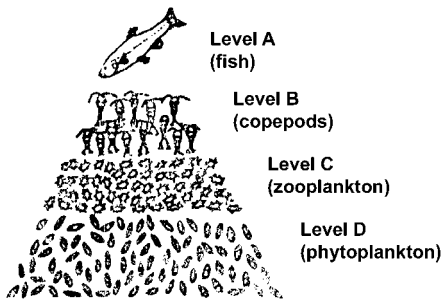
- A. fruit → toad → snake → mouse  
B. snake → grasshopper → deer → wolf  
C. mouse → raccoon → snake → toad  
D. grass → grasshopper → raccoon → wolf

23. An organism in the diagram that occupies the niche of a secondary consumer is the



- A. nitrifying bacteria      B. pea plant  
C. rabbit                      D. hawk

24. Primary consumers are found at level



- A. A      B. B      C. C      D. D

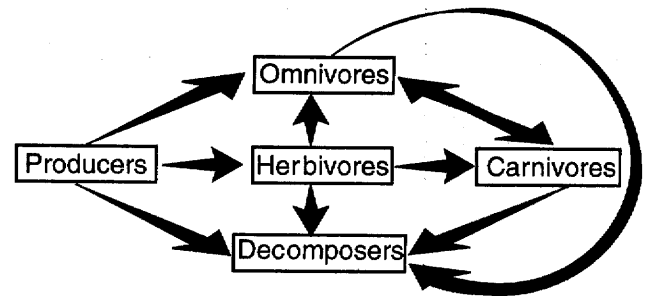
25. Variations within a species are most likely the result of

- A. mutations and sexual reproduction  
B. synapsis and disjunction  
C. mitosis and asexual reproduction  
D. overproduction and recombination

26. The first organism in a food chain must be

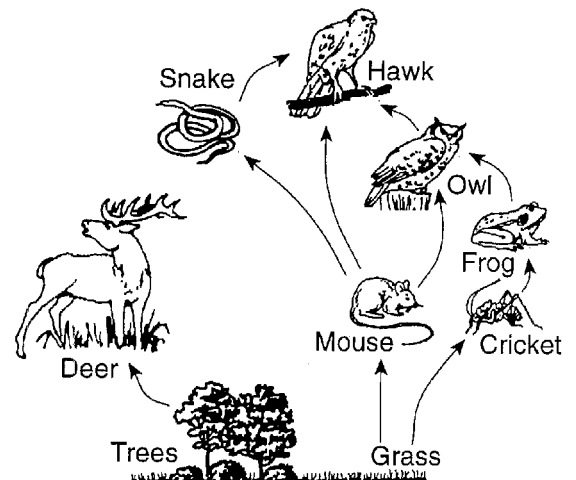
- A. an herbivore                      B. a heterotroph  
C. a saprophyte                      D. an autotroph

27. According to the diagram, omnivores can be classified as



- A. primary or secondary consumers  
B. primary consumers, only  
C. secondary consumers, only  
D. neither primary nor secondary consumers

28. The diagram shown represents a food web. Which organisms would most likely be adversely affected by a continuous decrease in the population of mice?

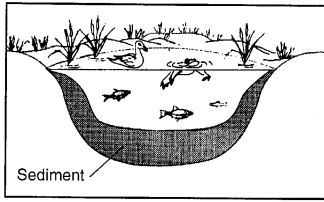


- A. grass      B. deer      C. crickets      D. hawks

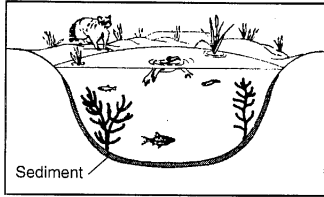
29. *Ursus horribilis*, the scientific name for the grizzly bear, refers to the bear's

- A. kingdom and phylum      B. kingdom and species  
C. genus and phylum              D. genus and species

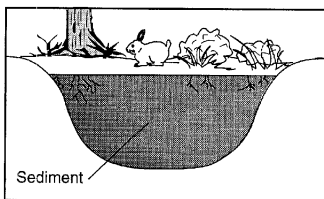
30. The diagrams represent events that occurred during succession in a pond.



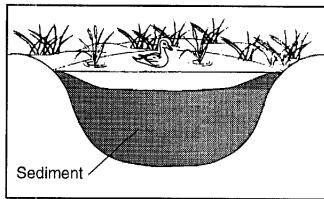
A



B



C



D

What is the correct sequence of the stages of succession in this pond?

- A. B → A → D → C      B. A → B → C → D  
 C. C → A → D → B      D. B → D → A → C
31. The relationship between athlete's foot fungus and humans is known as
- A. synthesis                      B. mutualism  
 C. parasitism                      D. commensalism
32. Some small fish attach themselves to the body of a shark without harming it and feed upon its left over food. This relationship between the shark and the fish is an example of
- A. commensalism                      B. mutualism  
 C. competition                      D. parasitism

33. All the cottontail rabbits in a country would represent

- A. a community                      B. a biome  
 C. a population                      D. an ecosystem

34. In an ecosystem, the ultimate source of all energy is

- A. photosynthesis                      B. oxygen  
 C. fermentation                      D. sunlight

35. Which of the following groups could be correctly classified as an ecosystem?

- A. the total of all plant and algae populations in a pond  
 B. the light, temperature, and minerals in a pond  
 C. the fungi, bacteria, and animals in a pond  
 D. the living and nonliving factors interacting in a pond

36. In an ecosystem, symbiotic relationships exist among the

- A. autotrophs, only                      B. heterotrophs, only  
 C. biotic factors                      D. abiotic factors

37. An example of an abiotic factor affecting aquatic organisms is the

- A. number of fish in the water environment  
 B. number of clams in the water environment  
 C. amount of dissolved oxygen in the water environment  
 D. amount of algae per cubic foot in the water environment

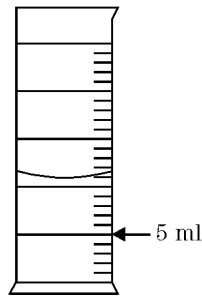
38. An experiment was designed to determine the effect of nitrates on plant growth. Two groups of plants were grown under identical conditions, except one group was watered with a dilute nitrate solution and the other group received water without nitrates. In this investigation, the group of plants grown without added nitrates is known as the

- A. abiotic factor                      B. control  
 C. variable                      D. environmental stimulus

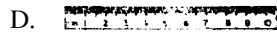
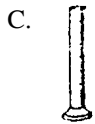
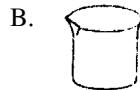
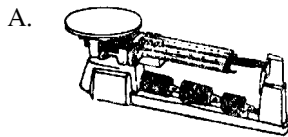
39. In a scientific investigation, after the question is defined, the next step is most likely
- formulating a hypothesis
  - identifying needed equipment
  - designing the experiment
  - collecting the data

40. In one of his experiments with pea plants, Mendel noted that 75% of the offspring of a certain cross had green pea pods. This statement would be considered
- an observation
  - an inference
  - a hypothesis
  - a conclusion

41. What is the total volume of water indicated in the graduated cylinder illustrated here?
- 10 mL
  - 11 mL
  - 12 mL
  - 13 mL

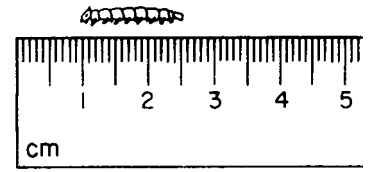


42. Which piece of equipment could be used to determine the mass of an earthworm?



43. A student measured a larva using a metric ruler, as represented in the diagram shown. What is the length of the larva?

- 25 cm
- 25 mm
- 15 cm
- 15 mm



44. Evidence of the changes in a species' physical characteristics over long geological periods can best be shown through a study of

- the homologous structures of present-day species
- comparative biochemistry
- the fossil record
- comparative embryology

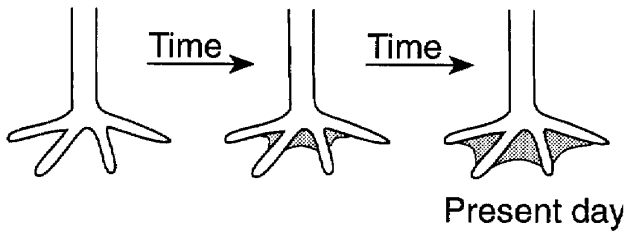
45. When lions prey on a herd of antelope, some antelope are eliminated. Which part of Darwin's theory of evolution may be used to describe this situation?

- acquired characteristics
- reproductive isolation
- survival of the fittest
- speciation due to mutations

46. Which theory of evolutionary change suggests that species have long periods of stability interrupted by geologically brief periods of significant change during which new species are formed?

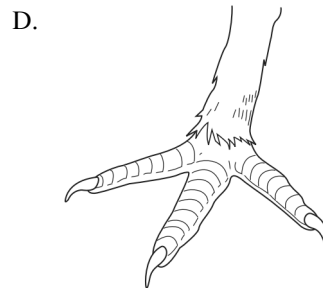
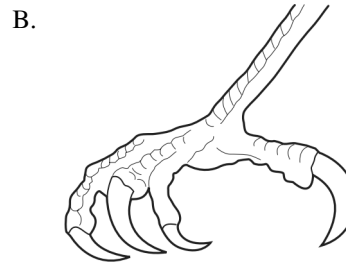
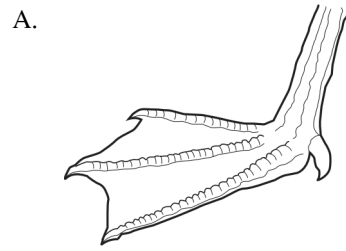
- gradualism
- geographic isolation
- punctuated equilibrium
- reproductive isolation

47. The changes in foot structure in a bird population over many generations are shown in the diagram. These changes can best be explained by the concept of



- A. evolution  
 B. extinction  
 C. stable gene frequencies  
 D. use and disuse
48. Which concept states that the presence of favorable variations enables organisms to adapt successfully to a change in the environment?
- A. natural selection  
 B. use and disuse  
 C. artificial selection  
 D. reproductive isolation
49. Which group of terms is in the correct order from most general to most specific?
- A. species, phylum, genus, kingdom  
 B. genus, species, kingdom, phylum  
 C. kingdom, phylum, genus, species  
 D. phylum, kingdom, species, genus

50. Which bird foot is *best* for swimming?



51. Geologic activity on an island physically separates a population of animals into two populations. Many generations later, when the two populations are no longer separated, they do not interbreed. What was the result of natural selection during this period of separation?
- A. a decrease in variation  
 B. a decrease in diversification  
 C. an increase in extinction  
 D. an increase in speciation



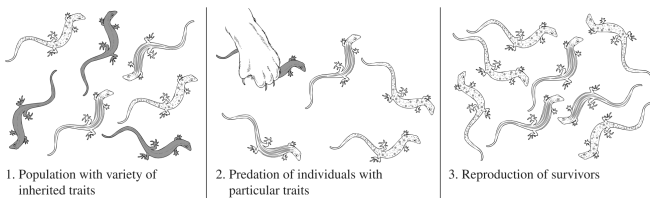
52. Vestigial structures, such as hip bones in whales and appendixes in humans, are those that have little or no function for the organism. What is the most likely reason for this loss of function over time?
- The organism is undergoing speciation.
  - The organism is experiencing genetic drift.
  - The structure was over utilized by the organism.
  - The structure was not highly beneficial to the organism.

53. The Venus flytrap plant lives in soil with few nutrients. The plant absorbs nutrients by trapping insects inside its leaves.

The ability of the Venus flytrap to trap insects is an example of which of the following?

- |                |                |
|----------------|----------------|
| A. Adaptation  | B. Parasitism  |
| C. Cooperation | D. Competition |

54. The diagrams below show changes in a desert lizard population.



Which biological concept is illustrated?

- |                           |                      |
|---------------------------|----------------------|
| A. polygenic traits       | B. natural selection |
| C. sex-linked inheritance | D. silent mutations  |
55. Suppose a population of flightless beetles becomes divided into two separate populations by the development of a city. The two populations will *most* likely become separate species if the two populations are—
- relatively small.
  - unable to interbreed.
  - able to produce many offspring.
  - made of different colored beetles.

56. A mouse population occupying two different islands that are very close together may become two separate species if—
- a new predator is introduced.
  - the smallest mice hide underground.
  - the separation between the islands widens.
  - a storm eliminates a large part of the population.
57. What process is *most* responsible for the extinction of most species of plants and animals that have lived on Earth?
- gene mutation
  - environmental changes
  - selective breeding
  - decrease in reproduction
58. Use the pictures below to answer the following question.



hover fly



honey bee

A hover fly looks like a honey bee. Which statement *best* explains how this adaptation helps the hover fly survive?

- Looking like a honey bee keeps other animals away from the hover fly's food.
- Looking like a honey bee allows the hover fly to collect more pollen.
- Looking like a honey bee allows the hover fly to blend with its environment.
- Looking like a honey bee keeps some predators from trying to eat the hover fly.

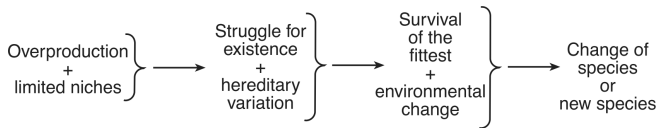
59. In North America, the eastern spotted skunk mates in late winter, and the western spotted skunk mates in late summer. Even though their geographic ranges overlap, the species do not mate with each other. What *most likely* prevents these two species from interbreeding?

- A. habitat isolation
- B. gametic isolation
- C. geographic isolation
- D. reproductive isolation

60. The fossil record of ancient life forms provides scientific evidence of

- A. direct harvesting
- B. selective breeding
- C. gene manipulation
- D. evolutionary changes

61. Which concept is best illustrated in the flowchart below?



- A. natural selection
- B. genetic manipulation
- C. dynamic equilibrium
- D. material cycles

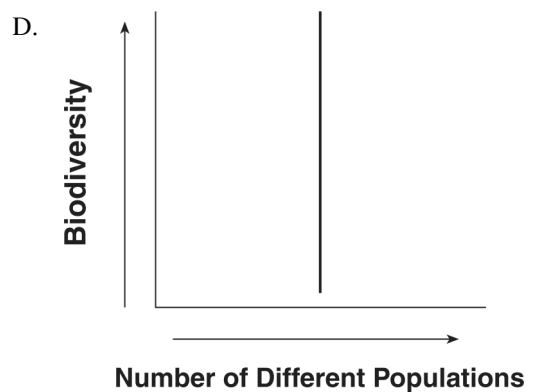
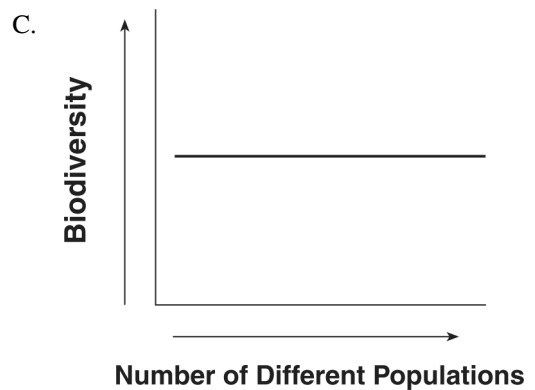
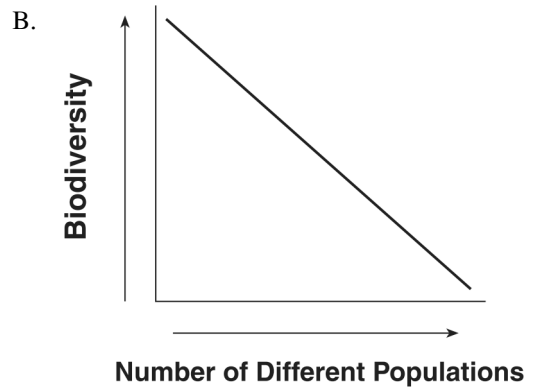
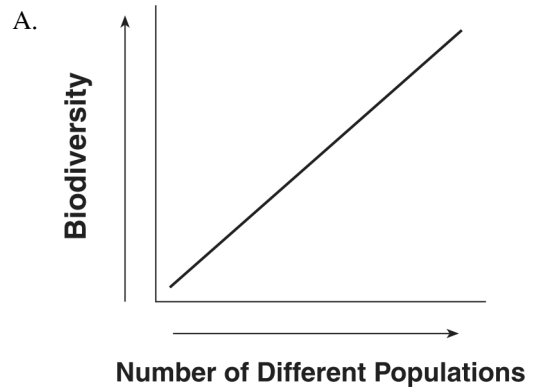
62. Examination of ancient rock layers at a certain location reveals many different fossils. Which conclusion can be drawn concerning the species that formed these fossils?

- A. Only the predators are still present.
- B. Many of them are now extinct.
- C. They produced offspring that were all genetically identical.
- D. They had no variations due to mutations.

63. Autotrophs might survive when heterotrophs cannot, because autotrophs are able to

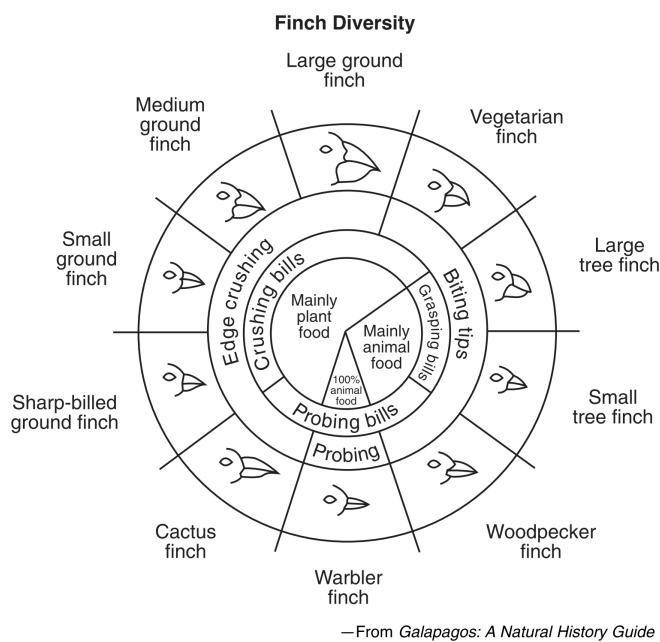
- A. reproduce asexually
- B. become dormant
- C. exist without respiration
- D. make their own food

64. Which graph best shows the relationship between the amount of biodiversity and the number of different populations in an ecosystem?



65. Some behaviors such as mating and caring for young are genetically determined in certain species of birds. The presence of these behaviors is most likely due to the fact that
- birds do not have the ability to learn
  - individual birds need to learn to survive and reproduce
  - these behaviors helped birds to survive in the past
  - within their lifetimes, birds developed these behaviors

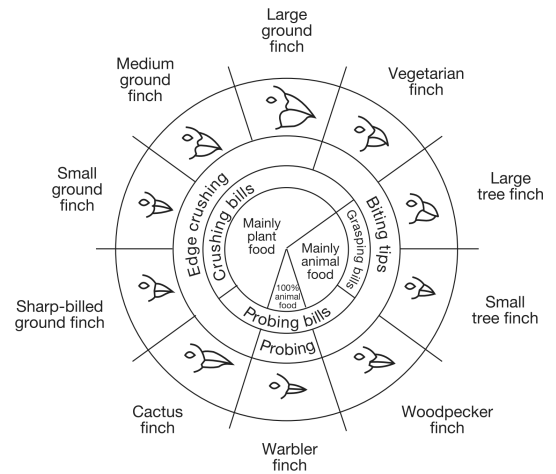
66. Base your answer(s) to the following question(s) on the information in the diagram below and on your knowledge of biology.



The differences observed in the bird beaks are most likely due to

- asexual reproduction of these finch species
- the selection for different shaped beaks that best suit different niches
- the genetic recombination associated with mitotic cell division
- the genetic engineering of the DNA of each of these species

67. Base your answer(s) to the following question(s) on the information below and on your knowledge of biology. The diagram below represents the relationship between beak structure and food in several species of finches in the Galapagos Islands.



From: *Galapagos: A Natural History Guide*

### Variations in Beaks of Galapagos Islands Finches

Which factor most directly influenced the evolution of the diverse types of beaks of these finches?

- predation by humans
- available food sources
- oceanic storms
- lack of available niches

68. Two food chains are represented below.

**Food chain A:** aquatic plant → insect → frog → hawk

**Food chain B:** grass → rabbit → hawk

Decomposers are important for supplying energy for

- food chain A, only
- food chain B, only
- both food chain A and food chain B
- neither food chain A nor food chain B

69. Evolution refers to change over a long period of time in

- a fossil
- a population
- a rock
- an embryo

70. Base your answer(s) to the following question(s) on the information below and on your knowledge of biology.

Cytochrome c is an enzyme located in the mitochondria of many types of cells. The number of differences in the amino acid sequences of Cytochrome c from different species are compared to human Cytochrome c in the data table below.

**Differences in Amino Acid Sequences**

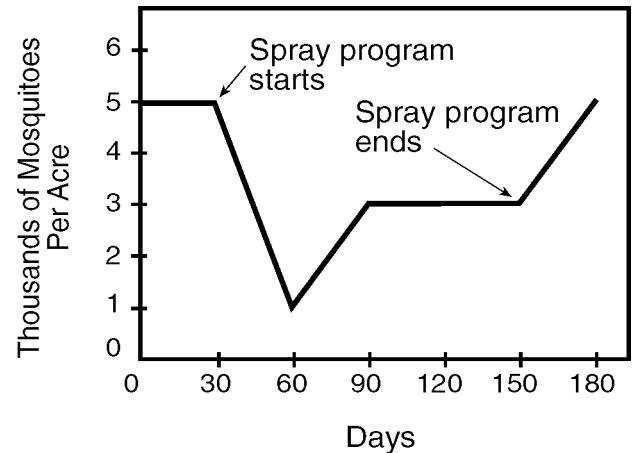
Organism	Number of Differences in Cytochrome c Compared to Humans
tuna	21
mold	48
moth	31
dog	11
horse	12
chicken	13
monkey	1

The fact that all of these organisms contain Cytochrome c could lead to the inference that

- A. Cytochrome c is essential for the reproduction of all organisms
  - B. these organisms have all evolved from an ancestor that produced Cytochrome c
  - C. mutations in genes that code for Cytochrome c always occur during DNA replication
  - D. only heterotrophs make Cytochrome c
71. A volcanic eruption destroyed a forest, covering the soil with volcanic ash. For many years, only small plants could grow. Slowly, soil formed in which shrubs and trees could grow. These changes are an example of
- A. manipulation of genes
  - B. evolution of a species
  - C. ecological succession
  - D. equilibrium

72. Base your answer(s) to the following question(s) on the information below and on your knowledge of biology.

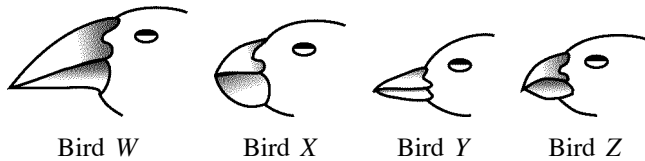
A small village was heavily infested with mosquitoes. The village was sprayed weekly with an insecticide for a period of several months. The results of daily counts of the mosquito population are shown in the graph below.



Which statement best explains why some mosquitoes survived after the first spraying?

- A. Some mosquitoes were adapted to the climatic change that occurred over the several-month period of spraying.
  - B. All of the mosquitoes contained DNA unique to the species.
  - C. The spraying of the insecticide represented a change in the environment to which all adult mosquitoes were adapted.
  - D. A natural variation existed within the mosquito population.
73. After a rabbit population reaches the carrying capacity of its habitat, the population of rabbits will most likely
- A. decrease, only
  - B. increase, only
  - C. alternately increase and decrease
  - D. remain unchanged

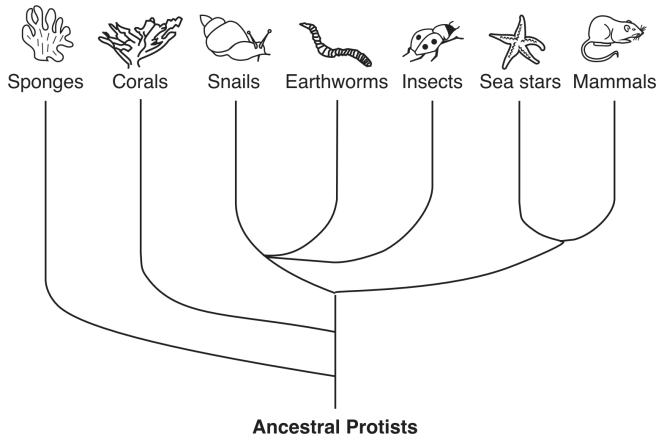
74. The dichotomous key shown below can be used to identify birds W, X, Y, and Z.



Dichotomous Key to Representative Birds	
1. a.	The beak is relatively long and slender..... <i>Certhidea</i>
b.	The beak is relatively stout and heavy.....go to 2
2. a.	The bottom surface of the lower beak is flat and straight ..... <i>Geospiza</i>
b.	The bottom surface of the lower beak is curved .....go to 3
3. a.	The lower edge of the upper beak has a distinct bend..... <i>Camarhynchus</i>
b.	The lower edge of the upper beak is mostly flat ..... <i>Platyspiza</i>

Bird X is most likely

- A. *Certhidea*                      B. *Geospiza*  
 C. *Camarhynchus*                D. *Platyspiza*
75. The diagram below represents possible evolutionary relationships between groups of organisms.



Which statement is a valid conclusion that can be drawn from the diagram?

- A. Snails appeared on Earth before corals.  
 B. Sponges were the last new species to appear on Earth.  
 C. Earthworms and sea stars have a common ancestor.  
 D. Insects are more complex than mammals.

76. A certain plant species, found only in one particular stream valley in the world, has a very shallow root system. An earthquake causes the stream to change its course so that the valley in which the plant species lives becomes very dry. As a result, the species dies out completely. The effect of this change on this plant species is known as

- A. evolution                                      B. extinction  
 C. mutation                                      D. succession
77. Extinction of a species could result from
- A. evolution of a type of behavior that produces greater reproductive success  
 B. synthesis of a hormone that controls cellular communication  
 C. limited genetic variability in the species  
 D. fewer unfavorable mutations in the species

78. The leg structures of many different vertebrates are quite similar in number and location of bones. Most scientists would probably explain this on the basis of

- A. needs of the organism  
 B. common ancestry  
 C. chance occurrence  
 D. inheritance of acquired traits

79. The study of living organisms and fossils suggests that organisms have undergone slow and continuous change since they first appeared on Earth. Based on the rate of change, this concept is known as

- A. gradualism  
 B. punctuated equilibrium  
 C. intermediate inheritance  
 D. cell theory

80. The species of finches that Darwin found on the Galapagos Islands displayed different structural and behavioral adaptations. These adaptations differed among the species according to the birds' varying habitats. Such adaptations most likely evolved as a result of

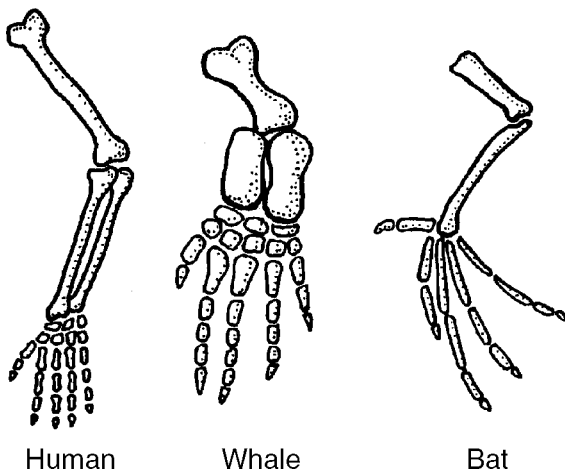
- A. use and disuse
- B. transmission of acquired characteristics
- C. reproductive isolation
- D. geographic isolation

81. The information in the chart provides data that can help in the identification of possible evolutionary relationships from the study of comparative

- A. cytology
- B. embryology
- C. anatomy
- D. biochemistry

Species	Sequence of amino acids in the same part of the the hemoglobin molecules
Human	Lys-Glu-His-Iso
Horse	Arg-Lys-His-Lys
Gorilla	Lys-Glu-His-Lys
Chimpanzee	Lys-Glu-His-Iso
Zebra	Arg-Lys-His-Arg

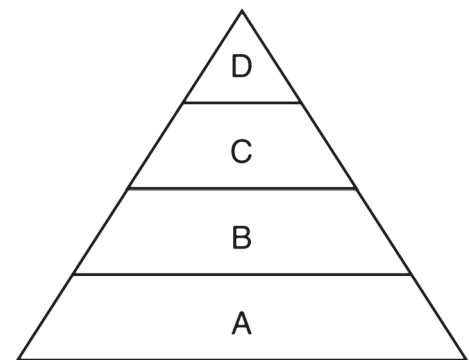
82. The accompanying diagrams show the bones in the forelimbs of three different organisms.



Differences in the bone arrangements support the hypothesis that these organisms

- A. are members of the same species
- B. may have descended from the same ancestor
- C. have adaptations to survive in different environments
- D. all contain the same genetic information

83. The diagram below represents interactions between organisms in a stable ecosystem.

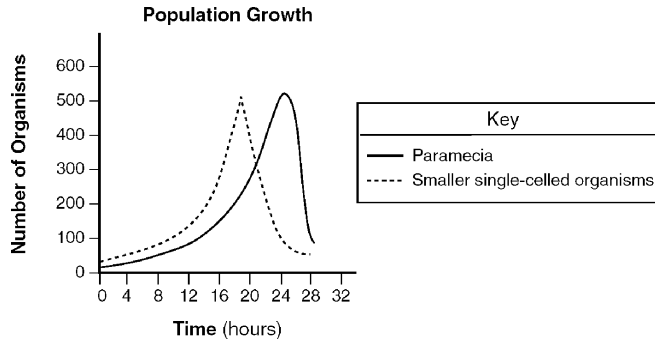


Which statement correctly describes organisms in this ecosystem?

- A. Organisms in level B obtain their energy directly from the Sun.
- B. Organisms in level C obtain their nutrients directly from organisms in level D.
- C. Organisms in level A are herbivores.
- D. Organisms in level D are heterotrophic.

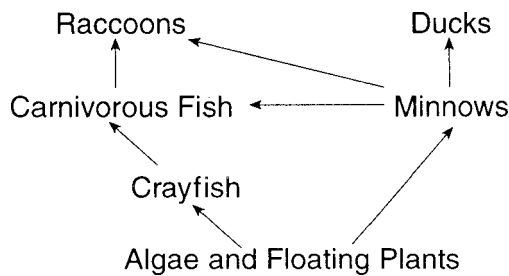
84. Base your answer(s) to the following question(s) on the information and graph below and on your knowledge of biology.

A population of paramecia (single-celled aquatic organisms) was grown in a 200-mL beaker of water containing some smaller single-celled organisms. Population growth of the organisms for 28 hours is shown in the graph below.



One likely explanation for the change in the paramecium population from 26 hours to 28 hours is that the

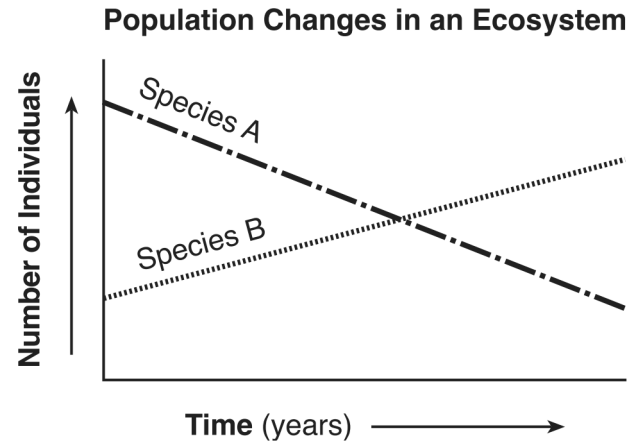
- A. carrying capacity of the beaker was exceeded
  - B. rate of reproduction increased
  - C. time allowed for growth was not sufficient
  - D. oxygen level was too high
85. The diagram below illustrates the relationships between organisms in an ecosystem.



In addition to sunlight, which factor would need to be added to make this a stable ecosystem?

- A. predators
- B. prey
- C. decomposers
- D. herbivores

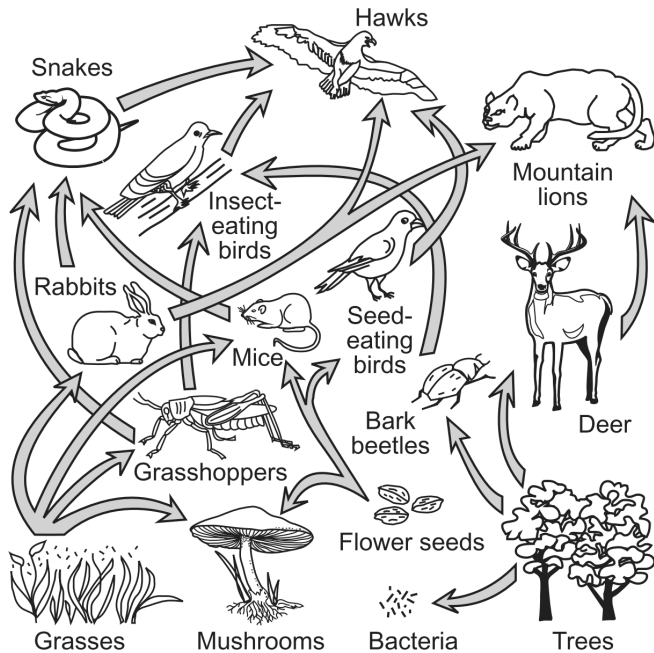
86. The graph below represents the populations of two different species in an ecosystem over a period of several years.



Which statement is a possible explanation for the changes shown?

- A. Species A is better adapted to this environment.
  - B. Species A is a predator of species B.
  - C. Species B is better adapted to this environment.
  - D. Species B is a parasite that has benefited species A.
87. Japanese beetles and gypsy moths were accidentally introduced into North America. The most probable reasons these insects have become serious pests in North America is that they
- A. were bred by research scientists and are resistant to all pesticides
  - B. are protected by environmental laws and feed on other insects species
  - C. have few natural enemies and reproduce successfully
  - D. are affected by biological controls and feed on plants
88. Researchers performing a well-designed experiment should base their conclusions on
- A. the hypothesis of the experiment
  - B. data from repeated trials of the experiment
  - C. a small sample size to insure a reliable outcome of the experiment
  - D. results predicted before performing the experiment

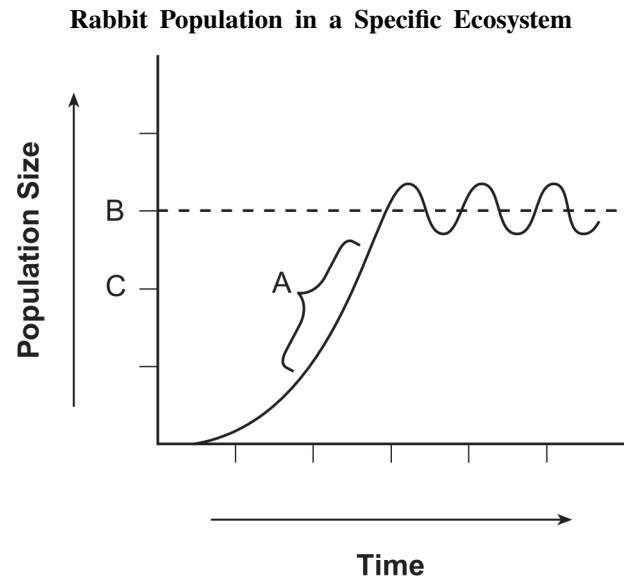
89. Base your answer(s) to the following question(s) on the diagram below and on your knowledge of biology. The diagram represents a food web.



Which statement correctly describes interactions between organisms in this ecosystem?

- A. Hawks are predators of insect-eating birds, but not of seed-eating birds.
  - B. Hawks and snakes prey on both rabbits and grasshoppers.
  - C. Rabbits and mice compete for both grasses and flower seeds.
  - D. Grasshoppers and mice compete for grasses, but not flower seeds.
90. DDT accumulates in the fatty tissues of animals and is transferred along food chains. Its concentration increases along each link of a food chain. Which of the following organisms would accumulate the highest concentration of DDT in a given food chain?
- A. rabbit (a herbivore)
  - B. corn (a producer)
  - C. field mouse (a primary consumer)
  - D. owl (a predator)

91. Base your answer(s) to the following question(s) on the graph below and on your knowledge of biology. The graph shows the growth of a population of rabbits in a specific ecosystem.

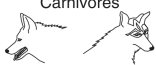


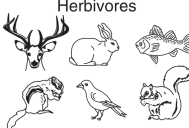
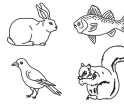









Which environmental factor could have caused the change indicated at A?

- A. increased predation by herbivores
  - B. increased availability of food
  - C. increased number of decomposers
  - D. increased competition among carnivores
92. What impact do the amounts of available energy, water, and oxygen have on an ecosystem?
- A. They act as limiting factors.
  - B. They are used as nutrients.
  - C. They recycle the residue of dead organisms.
  - D. They control environmental temperature.



93. The diagram below represents the varying biodiversity in three ecosystems.

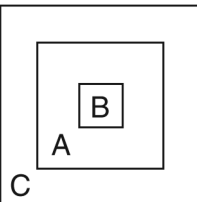
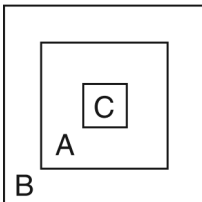
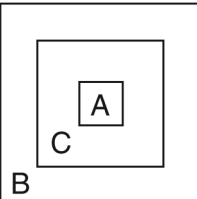
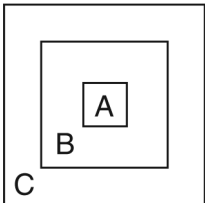
Ecosystem A	Ecosystem B	Ecosystem C
Carnivores 	Carnivores 	Carnivores 
Herbivores 	Herbivores 	Herbivores 
Autotrophs 	Autotrophs 	Autotrophs 
Decomposers 	Decomposers 	Decomposers 

The level of biodiversity in ecosystem A is high because it has the

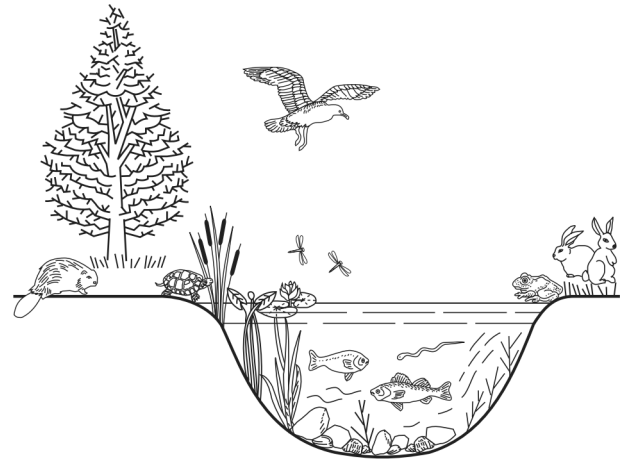
- A. least variety of energy levels
  - B. greatest variety of genetic material
  - C. greatest number of decomposers
  - D. least number of ecological niches
94. The chart below shows three ecological terms used to describe levels of organization on Earth.

A	ecosystem
B	population
C	biosphere

Which diagram best represents the relationship of these ecological terms?

- A. 
- B. 
- C. 
- D. 

95. The diagram below represents many species of plants and animals and their surroundings.

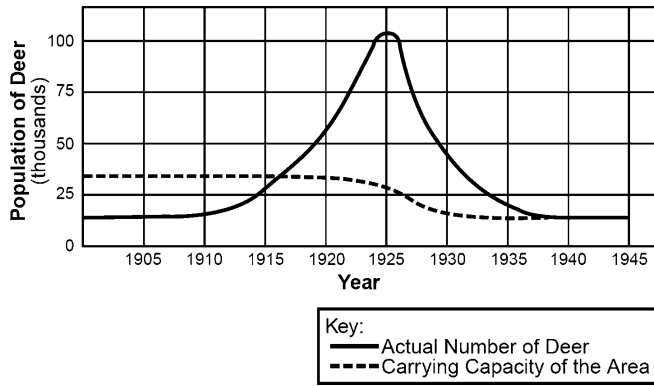


The diagram best represents

- A. a population
  - B. a community
  - C. an ecosystem
  - D. the biosphere
96. Which factor has the greatest influence on the type of ecosystem that will form in a particular geographic area?
- A. genetic variations in the animals
  - B. climate conditions
  - C. number of carnivores
  - D. percentage of nitrogen gas in the atmosphere
97. A student formulated a hypothesis that cotton will grow larger bolls (pods) if magnesium is added to the soil. The student has two experimental fields of cotton, one with magnesium and one without. Which data should be collected to support this hypothesis?

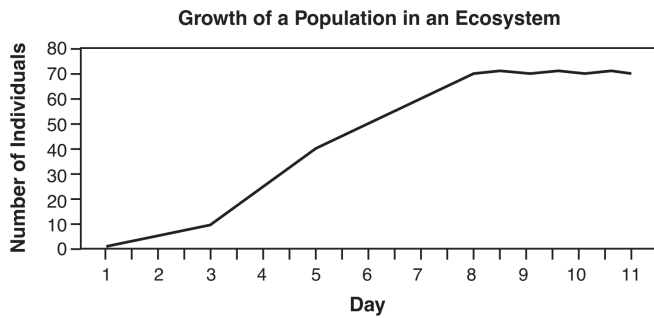
- A. height of the cotton plants in both fields
- B. diameter of the cotton bolls in both fields
- C. length of the growing season in both fields
- D. color of the cotton bolls in both fields

98. The accompanying graph provides information about the population of deer in a given area between 1900 and 1945.



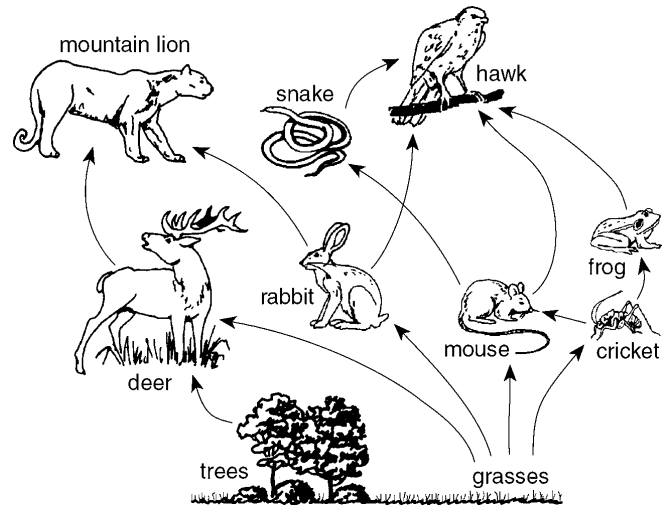
Which statement identifies the most likely reason that the carrying capacity of the area to support deer decreased between 1925 and 1930?

- A. The deer population decreased in 1926.
  - B. The number of predators increased between 1915 and 1925.
  - C. The deer population became too large.
  - D. An unusually cold winter occurred in 1918.
99. On which day did the population represented in the graph below reach the carrying capacity of the ecosystem?



- A. day 11
- B. day 8
- C. day 3
- D. day 5

100. Base your answer(s) to the following question(s) on the diagram of a food web and on your knowledge of biology.



If the population of mice is reduced by disease, which change will most likely occur in the food web?

- A. The cricket population will increase.
- B. The snake population will increase.
- C. The grasses will decrease.
- D. The deer population will decrease.