Causes of Biodiversity/Speciation

Name: _____ **Date:** _____

1. Which statement best explains the significance of meiosis in the process of evolution within a species?

   A. The gametes produced by meiosis ensure the continuation of any particular species by asexual reproduction.

   B. Equal numbers of eggs and sperm are produced by meiosis.

   C. Meiosis produces eggs and sperm that are alike.

   D. Meiosis provides for variation in the gametes produced by an organism.

2. Which factor has the greatest influence on the variety of species that survive in different regions of a marine habitat?

   A. depth of light penetration

   B. daily fluctuations in temperature

   C. size of predators

   D. average annual rainfall

3. In members of a bird species living on a remote island, the greatest number of beak variations in the population would most likely be found when

   A. there is a high level of competition for limited resources

   B. homeostasis is limited by a severe climate

   C. they have a large and varied food supply

   D. they are prey for a large number of predators

4. The different tools used during the beaks of finches lab represented

   A. feeding adaptations in finches

   B. nest construction adaptations

   C. variations in seed size

   D. variations in ecosystems

5. Which two processes result in variations that commonly influence the evolution of sexually reproducing species?

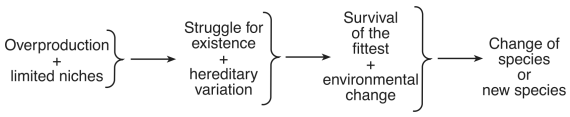
   A. mutation and genetic recombination

   B. mitosis and natural selection

   C. extinction and gene replacement

   D. environmental selection and selective breeding

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



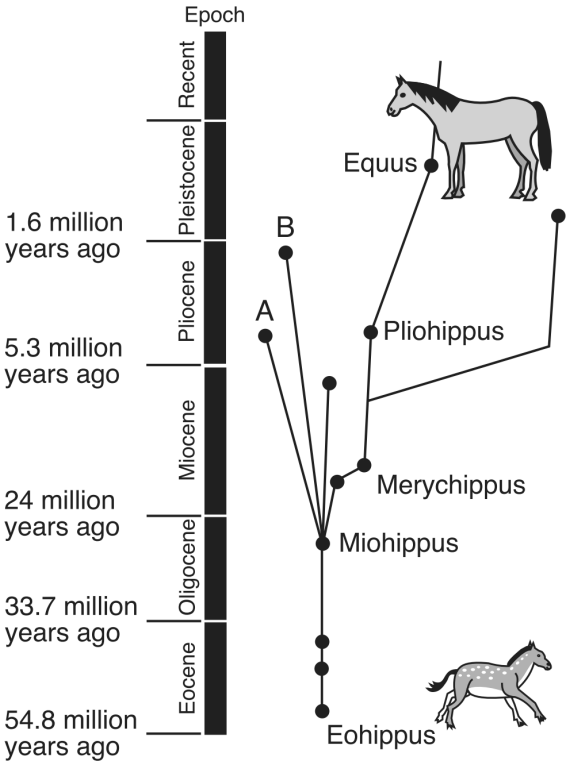
A. natural selection

B. genetic manipulation

C. dynamic equilibrium

D. material cycles

7. Base your answer(s) to the following question(s) on the diagram below, which represents possible relationships between animals in the family tree of the modern horse, and on your knowledge of biology.



One possible conclusion that can be drawn regarding ancestral horses *A* and *B* is that

A. *A* was better adapted to changes that occurred during the Pliocene Epoch than was *B*

B. the areas that *B* migrated to contained fewer varieties of producers than did the areas that *A* migrated to

C. competition between *A* and *B* led to the extinction of *Pliohippus*

D. the adaptive characteristics present in both *A* and *B* were insufficient for survival

8. *Miohippus* has been classified as a browser (an animal that feeds on shrubs and trees) while *Merychippus* has been classified as a grazer (an animal that feeds on grasses). One valid inference that can be made regarding the evolution of modern horses based on this information is that

   A. *Eohippus* inhabited grassland areas throughout the world

   B. *Pliohippus* had teeth adapted for grazing

   C. *Equus* evolved as a result of the migration of *Pliohippus* into forested areas due to increased competition

   D. ecological succession led to changes in tooth structure during the Eocene Epoch

9. Researchers discovered four different species of finches on one of the Galapagos Islands. DNA analysis showed that these four species, shown in the illustration below, are closely related even though they vary in beak shape and size. It is thought that they share a common ancestor.

   Which factor most likely influenced these differences in beak size and shape?

   A. Birds with poorly adapted beaks changed their beaks to get food.

   B. Birds with yellow beaks were able to hide from predators.

   C. Birds with successful beak adaptations obtained food and survived to have offspring.

   D. Birds with large, sharp beaks become dominant.

10. Which process will increase variations that could be inherited?

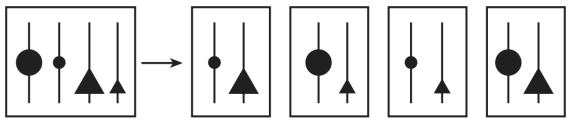
   A. mitotic cell division

   B. active transport

   C. recombination of genes

   D. synthesis of proteins

11. The diagram below represents the genetic contents of cells before and after a specific reproductive process.



This process is considered a mechanism of evolution because it

A. decreases the chance for new combinations of inheritable traits in a species

B. decreases the probability that genes can be passed on to other body cells

C. increases the chance for variations in offspring

D. increases the number of offspring an organism can produce

12. The kit fox and red fox species are closely related. The kit fox lives in the desert, while the red fox inhabits forests. Ear size and fur color are two differences that can be observed between the species. An illustration of these two species is shown below.

Which statement best explains how the differences between these two species came about?

A. Different adaptations developed because the kit fox preferred hotter environments than the red fox.

B. As the foxes adapted to different environments, differences in appearance evolved.

C. The foxes evolved differently to prevent overpopulation of the forest habitat.

D. The foxes evolved differently because their ancestors were trying to avoid competition.

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

Scientists attempted to determine the evolutionary relationships between three different plant species, *A*, *B*, and *C*. In order to do this, they examined the stems and DNA of these species. Diagram 1 represents a microscopic view of the cross sections of the stems of these three species. DNA was extracted from all three species and analyzed using gel electrophoresis. The results are shown in diagram 2. Based on the data they collected, they drew diagram 3 to represent the possible evolutionary relationships.

Diagram 1

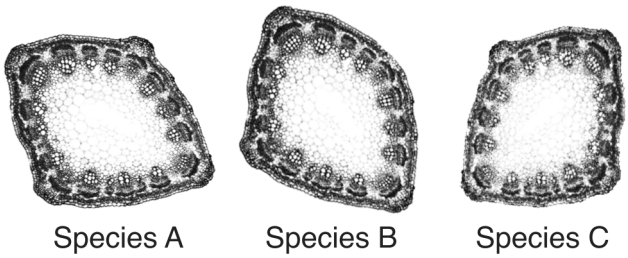


Diagram 2

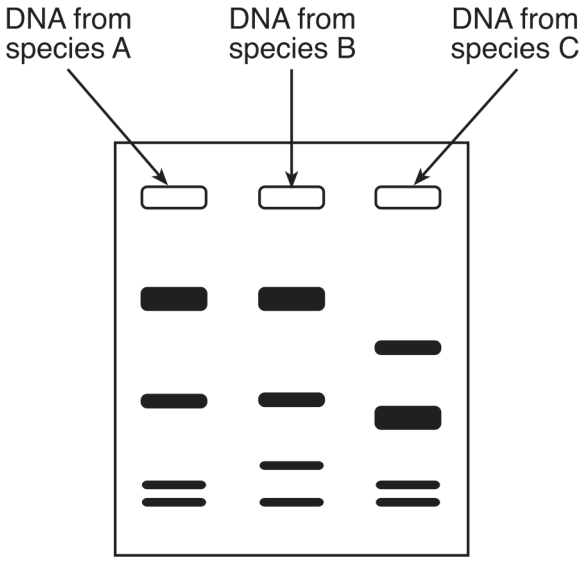
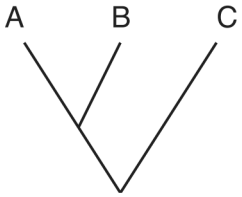


Diagram 3

Possible Evolutionary Relationships Between Species A, B, and C



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

This technique used to analyze DNA involves the

A. synthesis of new DNA strands from subunits

B. separation of DNA fragments on the basis of size

C. production of genetically engineered DNA molecules

D. removal of defective genes from DNA

14. The sorting and recombination of genes during reproduction is important to evolution because these processes

A. decrease variation and help maintain a stable population

B. increase variation that enables species to adapt to change

C. decrease the chances of producing offspring that are adapted to the environment

D. increase the ability of all the offspring to adapt to the environment

15. Which situation is *least* likely to result in new inherited characteristics?

A. altering genetic information

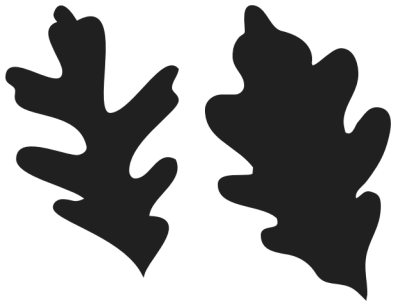
B. changes in the structure of genes

C. producing new individuals by means of cloning

D. changes in the structure of individual chromosomes

16. The cells that make up leaves on a tree are genetically identical, yet the leaves often have different shapes and sizes, as shown in the diagram below.

Leaves of White Oak *Querus alba*



Top leaves Bottom leaves

Which statement best explains this difference in leaf appearance?

A. The leaves at the top of the tree get more sunlight, causing the genes in their cells to be expressed differently.

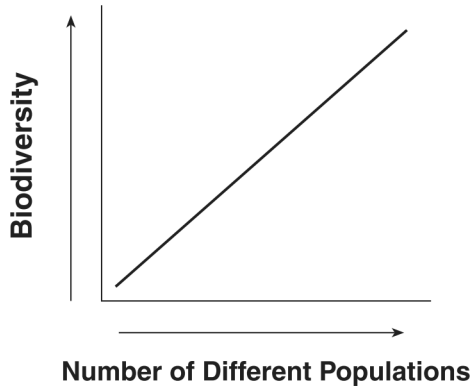
B. The genes in the cells of leaves at the top of the tree are destroyed by sunlight, causing the leaves to stop growing.

C. The leaves near the bottom of the tree have more genes related to leaf size, causing them to grow larger.

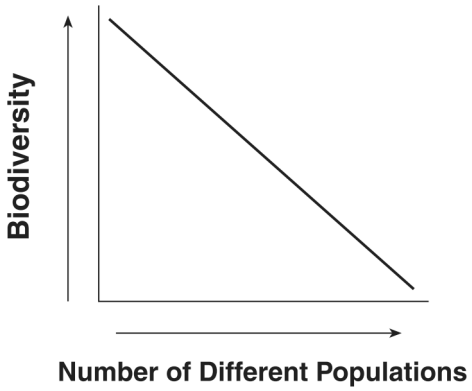
D. The genes in the cells of leaves near the bottom of the tree increase in number, causing them to grow even larger.

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

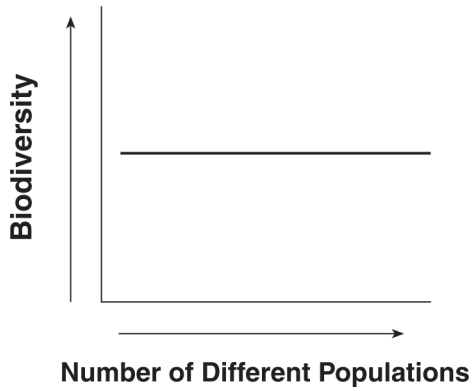
A.



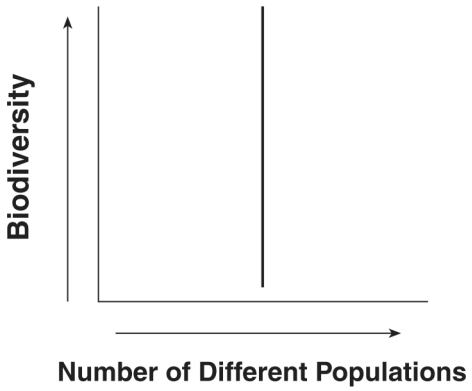
B.



C.

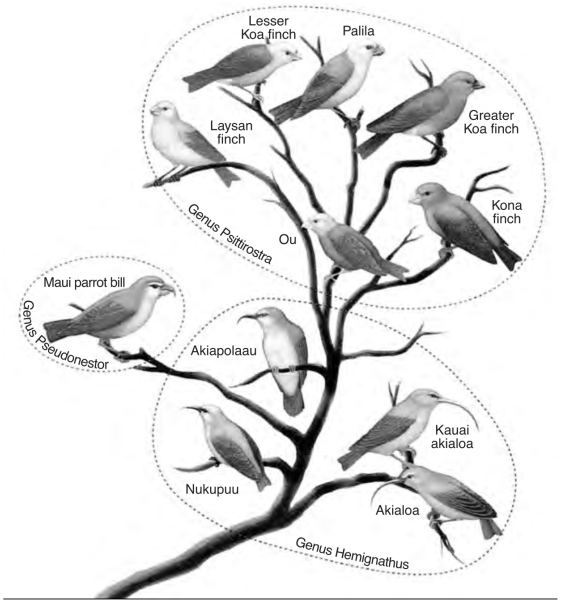


D.



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

The circled areas in the diagram represent bird species that are in the same genus, a classification group that includes closely related species. These birds are found on the Hawaiian Islands.



Source: *Biology, 9th Edition*, Mader, McGraw-Hill, Boston, MA, 2007, p.313

Which processes are directly responsible for the presence of the different species of birds shown in the diagram?

A. mitosis and differentiation

B. gene manipulation and overpopulation

C. gene mutations and natural selection

D. competition and cloning

19. The variations that exist in a population of wild giraffes are usually a result of events that occur during

A. mitotic division

B. genetic engineering

C. asexual reproduction

D. sexual reproduction

20. Which processes lead to the greatest variety of genetic combinations?

A. asexual reproduction and cloning

B. meiosis and fertilization

C. meiosis and mitosis

D. cloning and mitosis

21. The extremes of dry and wet weather of the Galapagos Islands cause the food supply to constantly change. During dry years, the food is mainly large, hard seeds, and finches with large beaks are found in greater numbers.

Which statement best explains this observation?

A. Dry environments cause mutations in finches.

B. Finches grow larger when they have more water.

C. Small finches become smaller during dry seasons.

D. Large beak size is an adaptation to dry conditions.

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

> . . . Unless actions are taken to slow the decline of domesticated honeybees and augment [increase] their populations with wild bees, many fruits and vegetables may disappear from the food supply, said Claire Kremen, a conservation biologist at Princeton University in New Jersey. . . .
>
> The honeybee decline, which is affecting domesticated and wild bee populations around the world, is mostly the result of diseases spread as a result of mites and other parasites as well as the spraying of crops with pesticides, scientists say. . .
>
> Source: "Bee Declines May Spell End of Some Fruits, Vegetables," *National Geographic News,* October 5, 2005

Some honeybees have been able to survive the changes in their environment and reproduce. This is most likely due to

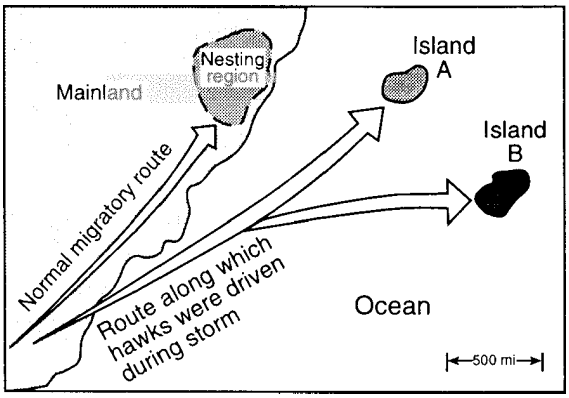
A. the aggressive behavior of wild bees

B. an abundance of food sources for the bees

C. genetic diversity in the bees

D. lack of mutations in the bees

23. Thousands of years ago, a large flock of hawks was driven from its normal migratory route by a severe storm. The birds scattered and found shelter on two distant islands, as shown on the map below. The eviornment of island *A* is very similar to the hawk's original nesting region. The enviornment of island *B* is very different from that of island *A*. The hawks have survived on these islands to the present day with no migration between the populations.



Which statement most accurately predicts the present-day condition of these island hawk populations?

A. The hawks that landed on island *B* have evolved more that those on island *A*

B. The hawks that landed on island *A* have evolved more that those on island *B*

C. The populations on island *A* and *B* have undergone identical mutations.

D. The hawks on island *A* have given rise to many new species.

24. Exposure to cosmic rays, x rays, ultraviolet rays, and radiation from radioactive substances may promote

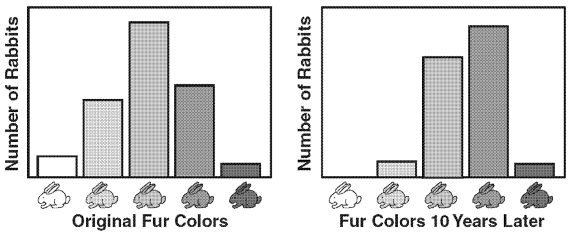
A. the production of similar organisms

B. diversity among organisms

C. an increase in population size

D. a change from sexual to asexual reproduction

25. The accompanying diagram illustrates the change that occurred in the physical appearance of a rabbit population over a 10-year period.



Which condition would explain this change over time?

A. a decrease in the mutation rate of the rabbits with black fur

B. a decrease in the advantage of having white fur

C. an increase in the advantage of having white fur

D. an increase in the chromosome number of the rabbits with black fur

26. In order for new species to develop, there must be a change in the

A. temperature of the environment

B. migration patterns within a population

C. genetic makeup of a population

D. rate of succession in the environment

27. Scientists compared fossil remains of a species that lived 5,000 years ago with members of the same species living today. Scientists concluded that this species had changed very little over the entire time period. Which statement best accounts for this lack of change?

A. The environment changed significantly and those offspring without favorable characteristics died.

B. The environment changed significantly, but the species had no natural enemies for a long period of time.

C. The environment did not change significantly and those offspring expressing new characteristics survived their natural enemies.

D. The environment did not change significantly and those offspring expressing new characteristics did not survive.

28. Which factor is *least* likely to contribute to an increase in the rate of evolution?

A. presence of genetic variations in a population

B. environmental selection of organisms best adapted to survive

C. chromosomal recombinations

D. a long period of environmental stability

29. Galapagos finches evolved partly due to

A. cloning and recombination

B. migration and selective breeding

C. mutation and asexual reproduction

D. variation and competition

30. Thousands of years ago, giraffes with short necks were common within giraffe populations. Nearly all giraffe populations today have long necks. This difference could be due to

A. giraffes stretching their necks to keep their heads out of reach of predators

B. giraffes stretching their necks so they could reach food higher in the trees

C. a mutation in genetic material controlling neck size occurring in some skin cells of a giraffe

D. a mutation in genetic material controlling neck size occurring in the reproductive cells of a giraffe

31. A new chemical was discovered and introduced into a culture containing one species of bacteria. Within a day, most of the bacteria were dead, but a few remained alive. Which statement best explains why some of the bacteria survived?

A. They had a genetic variation that gave them resistance to the chemical.

B. They were exposed to the chemical long enough to develop a resistance to it.

C. They mutated and became a different species after exposure to the chemical.

D. They absorbed the chemical and broke it down in their digestive systems.

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

> When Charles Darwin traveled to the Galapagos Islands, he observed 14 distinct varieties of finches on the islands. Darwin also observed that each finch variety ate a different type of food and lived in a slightly different habitat from the other finches. Darwin concluded that the finches all shared a common ancestor but had developed different beak structures.

The 14 varieties of finches are most likely the result of

A. absence of biodiversity

B. biological evolution

C. asexual reproduction

D. lack of competition

33. The second sentence best describes

A. an ecosystem

B. a food web

C. a niche

D. a predator/prey relationship

34. The teeth of carnivores are pointed and are good for puncturing and ripping flesh. The teeth of herbivores are flat and are good for grinding and chewing. Which statement best explains these observations?

A. Herbivores have evolved from carnivores.

B. Carnivores have evolved from herbivores.

C. The two types of teeth most likely evolved as a result of natural selection.

D. The two types of teeth most likely evolved as a result of the needs of an organism.

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

> In the Beaks of Finches laboratory activity, students were each assigned a tool to use to pick up seeds. In round one, students acting as birds used their assigned tools to pick up small seeds from their own large dishes (the environment) and place them in smaller dishes (their stomachs). The seeds collected by each student were counted. Some students were able to collect many seeds, while others collected just a few.
>
> In round two, students again used their assigned tools to collect seeds. This time several students were picking up seeds from the same dish of seeds.

One factor that influences the evolution of a species that was not part of this laboratory activity is

A. struggle for survival

B. variation

C. competition

D. overproduction

36. Species of bacteria can evolve more quickly than species of mammals because bacteria have

A. less competition

B. more chromosomes

C. lower mutation rates

D. higher rates of reproduction

37. Certain insects resemble the bark of the trees on which they live. Which statement provides a possible biological explanation for this resemblance?

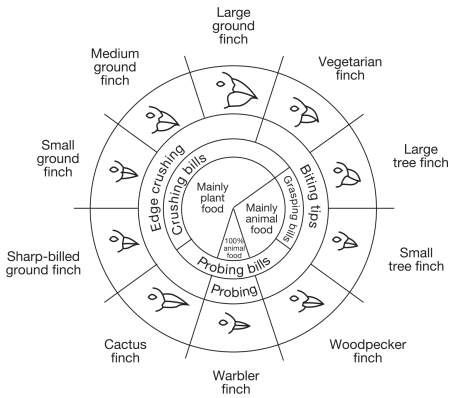
A. The insects needed camouflage so they developed protective coloration.

B. Natural selection played a role in the development of this protective coloration.

C. The lack of mutations resulted in the protective coloration.

D. The trees caused mutations in the insects that resulted in protective coloration.

38. 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?

A. predation by humans

B. available food sources

C. oceanic storms

D. lack of available niches

39. What will most likely occur as a result of changes in the frequency of a gene in a particular population?

A. ecological succession

B. biological evolution

C. global warming

D. resource depletion

40. A characteristic that an organism exhibits during its lifetime will only affect the evolution of its species if the characteristic

A. results from isolation of the organism from the rest of the population

B. is due to a genetic code that is present in the gametes of the organism

C. decreases the number of genes in the body cells of the organism

D. causes a change in the environment surrounding the organism

41. Which factor most likely contributed to the evolution of Galapagos Islands finches with different beak shapes?

A. similar climates on the different islands

B. competition between the finches for food

C. cloning experiments carried out by native people on the islands

D. increased rate of asexual reproduction

42. When changes occur in the genes of sex cells, these changes

A. lead to mutations in the parent organism

B. are always harmful to the offspring

C. can be the basis for evolutionary change

D. only affect asexually reproducing organisms

43. A population of animals is permanently split by a natural barrier into two separate populations in different environments. What will likely result after a long period of time?

A. The evolution of the two populations will be identical.

B. The production of variations will stop in the two populations.

C. The two populations will evolve into separate species.

D. Autotrophic nutrition will replace heterotrophic nutrition in the two populations.

44. In order for a species to evolve, it must be able to

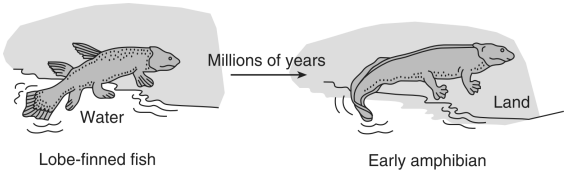
A. consume a large quantity of food

B. reproduce successfully

C. maintain a constant body temperature

D. be domesticated

45. The diagram below represents one possible evolutionary change that could have led lobe-finned fish to develop into the first amphibians. Amphibians are animals that live on land some of their life.



This change from fins on the lobe-finned fish to legs and feet on the early amphibian is most likely due to

A. a sudden mutation that changed the gills of the lobe-finned fish to lungs

B. increased competition between animals that had adapted to living on the land

C. the need to move to land because of increased competition for food in the ocean

D. variations among offspring, followed by natural selection

46. In a population of birds, the percentage of individuals having a certain gene changes from 20% to 60% over the span of several hundred years. This situation will most likely affect the rate of

A. biological evolution

B. asexual reproduction

C. gene mutation

D. ecological succession

47. One explanation for the variety of organisms present on Earth today is that over time

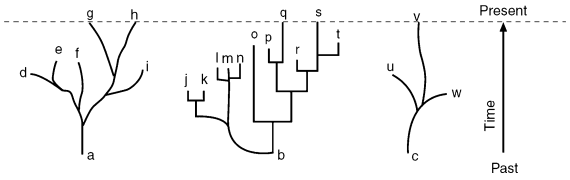
A. new species have adapted to fill available niches in the environment

B. evolution has caused the appearance of organisms that are similar to each other

C. each niche has changed to support a certain variety of organism

D. the environment has remained unchanged, causing rapid evolution

48. According to some scientists, patterns of evolution can be illustrated by the accompanying diagrams.



Which statement best explains the patterns seen in these diagrams?

A. The organisms at the end of each branch can be found in the environment today.

B. The organisms that are living today have all evolved at the same rate and have undergone the same kinds of changes.

C. Evolution involves changes that give rise to a variety of organisms, some of which continue to change through time while others die out.

D. These patterns cannot be used to illustrate the evolution of extinct organisms.

49. The Florida panther, a member of the cat family, has a population of fewer than 100 individuals and has limited genetic variation. Which inference based on this information is valid?

A. These animals will begin to evolve rapidly.

B. Over time, these animals will become less likely to survive in a changing environment.

C. These animals are easily able to adapt to the environment.

D. Over time, these animals will become more likely to be resistant to disease.

50. Which process is *least* likely to add to the variety of traits in a population?

A. deletion of bases from DNA

B. genetic engineering

C. accurate replication of DNA

D. exchange of segments between chromosomes

51. Beak structures differ between individuals of one species of bird. These differences most likely indicate

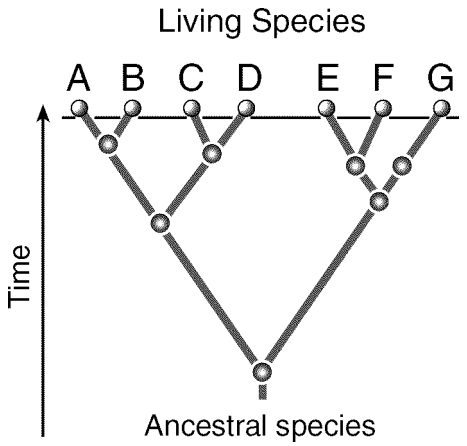
A. the presence of a variety of food sources

B. a reduced rate of reproduction

C. a large supply of one kind of food

D. an abundance of predators

52. The evolutionary pathways of seven living species are shown in the diagram below.



Which two species are likely to have the most similar DNA base sequences?

A. *B* and *G*

B. *E* and *G*

C. *B* and *C*

D. *C* and *D*

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

> When Charles Darwin traveled to the Galapagos Islands, he observed 14 distinct varieties of finches on the islands. Darwin also observed that each finch variety ate a different type of food and lived in a slightly different habitat from the other finches. Darwin concluded that the finches all shared a common ancestor but had developed different beak structures.

The different beak structures mentioned in the last sentence were most likely influenced by

A. selection for favorable variations

B. environmental conditions identical to those of the common ancestor

C. abnormal mitotic cell division

D. characteristics that are acquired during the bird's lifetime

54. In a group of mushrooms exposed to a poisonous chemical, only a few of the mushrooms survived. The best explanation for the resistance of the surviving mushrooms is that the resistance

A. was transmitted to the mushrooms from the poisonous chemical

B. resulted from the presence of mutations in the mushrooms

C. was transferred through the food web to the mushrooms

D. developed in response to the poisonous chemical

55. Variation in the offspring of sexually reproducing organisms is the direct result of

A. sorting and recombining of genes

B. replication and cloning

C. the need to adapt and maintain homeostasis

D. overproduction of offspring and competition

56. The *least* genetic variation will probably be found in the offspring of organisms that reproduce using

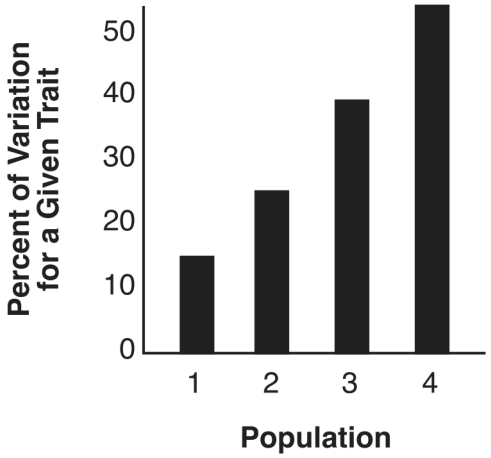
A. mitosis to produce a larger population

B. meiosis to produce gametes

C. fusion of eggs and sperm to produce zygotes

D. internal fertilization to produce an embryo

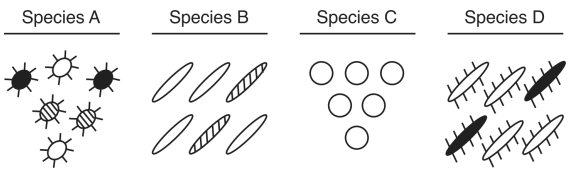
57. The graph below shows the percent of variation for a given trait in four different populations of the same species. The populations inhabit similar environments.



In which population will the greatest number of individuals most likely survive if a significant environmental change related to this trait occurs?

A. 1 B. 2 C. 3 D. 4

58. The diagram below represents four different species of bacteria.



Which statement is correct concerning the chances of survival for these species if there is a change in the environment?

A. Species *A* has the best chance of survival because it has the most genetic diversity.

B. Species *C* has the best chance of survival because it has no gene mutations.

C. Neither species *B* nor species *D* will survive because they compete for the same resources.

D. None of the species will survive because bacteria reproduce asexually.

59. In several species of birds, the males show off their bright colors and long feathers. The dull-colored females usually pick the brightest colored males for mates. Male offspring inherit their father's bright colors and long feathers. Compared to earlier generations, future generations of these birds will be expected to have a greater proportion of

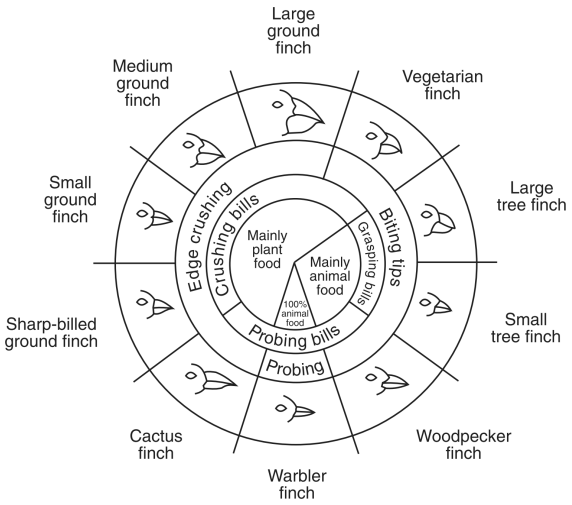
A. bright-colored females

B. dull-colored females

C. dull-colored males

D. bright-colored males

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



Variations in Beaks of Galapagos Islands Finches

Which two finches would compete the *least* for food?

A. small ground finch and large ground finch

B. large ground finch and sharp-billed ground finch

C. small tree finch and medium ground finch

D. vegetarian finch and small ground finch

61. Agriculturists have developed some varieties of vegetables from common wild mustard plants, which reproduce sexually. Which statement best explains the development of these different varieties of vegetables?

A. Different varieties can develop from a single species as a result of the recombination of genetic information.

B. Different species can develop from a single species as a result of the effect of similar environmental conditions.

C. Mutations will occur in the genes of a species only if the environment changes.

D. Variations in a species will increase when the rate of mitosis is decreased.

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

A valuable medicine is obtained from a certain rare species of plant. Scientists are anxious to find another more abundant species of plant that is closely related to the rare one, and also produces the medicine.

Two newly discovered plant species, *A* and *B*, were studied and compared to the rare one. The results of the study are shown in the table below.

Species of Plant	Characteristics of Flowers	Shape of Leaves	Species Number of Chromosomes	Enzyme A Present	Enzyme B Present	Enzyme C Present
rare species	pink 5 petals	round	36	yes	yes	yes
species *A*	pink 5 petals	oval	34	no	no	yes
species *B*	white 5 petals	round	36	yes	yes	yes

Which procedure could also be carried out to help determine which newly discovered species is most closely related to the rare species?

A. measurement of respiration rate in the plants

B. chromatography of pigment extracts from the plants

C. determination of the type of gas released by photosynthesis in the plants

D. analysis of chemical bonds present in glucose in the plants

63. When a species includes organisms with a wide variety of traits, it is most likely that this species will have

A. a high proportion of individuals immune to genetic diseases

B. a greater chance to survive if environmental conditions suddenly change

C. less success competing for resources

D. limitless supplies of important resources, such as food and water

64. Parrots are tropical birds. However, in some areas of New York City, some parrots have been able to survive outdoors year-round. These parrots survive, while most others cannot, due to

A. overproduction of offspring

B. extinction of previous species

C. asexual reproduction of parrots with a mutation

D. a variation that allows these parrots to live in colder climates

65. Which situation results in a characteristic that is inheritable?

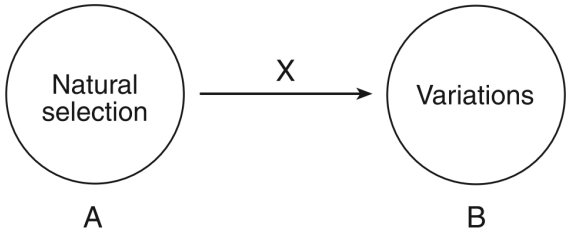
A. A limb is lost when two marine organisms fight.

B. A puppy learns to beg for food by watching an older dog perform tricks.

C. A gene is inserted into a bacterium, allowing the organism to produce insulin.

D. A random mutation causes the immediate death of a microbe.

66. The diagram below represents the relationship between natural selection and variation. The arrow between them is labeled X.



Which phrase best indicates the meaning of the arrow labeled X?

A. is dependent on

B. increases the rate of

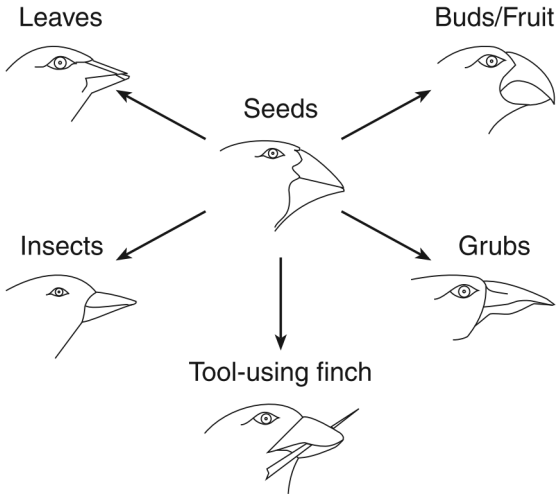
C. decreases the rate of

D. is independent of

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

Finches on the Galapagos Islands are thought to have originated from South America and to have evolved into new species over the last 10,000 years. Some of this evolution is represented in the diagram below.

Darwin's Finches
Adaptive Radiation



The success of the finches on the Galapagos was most likely due to the

A. large numbers of other birds competing for food

B. mutations occurring in every offspring

C. birds occupying the same island

D. birds adapting to different niches

68. The photograph below shows two penguins of the same species displaying different feather color patterns.

Source: http://green.yahoo.com/blog/guest_bloggers/24/all-black-penguin-discovered.html

The newly discovered all-black penguin had only black feathers since emerging from the egg. The sudden appearance of this characteristic was most likely due to

A. a change in environmental conditions

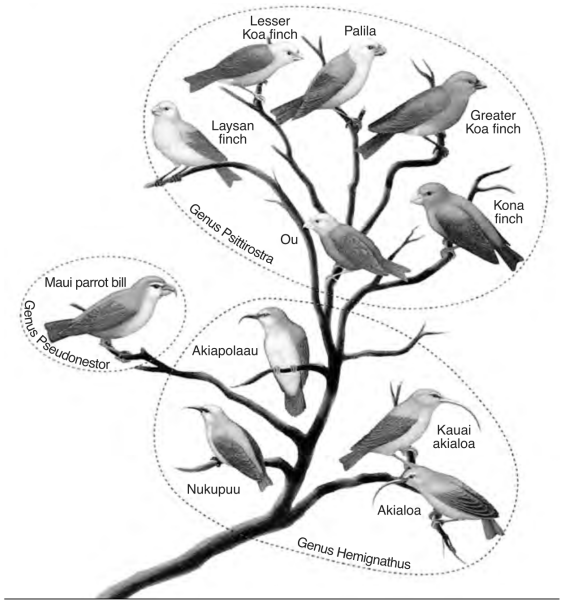
B. deposition of oil on the feathers due to pollution

C. a random change in the sequences of bases in DNA

D. a change in the diet of the penguin chick

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

The circled areas in the diagram represent bird species that are in the same genus, a classification group that includes closely related species. These birds are found on the Hawaiian Islands.



Source: *Biology, 9th Edition*, Mader, McGraw-Hill, Boston, MA, 2007, p.313

Which two finches are most closely related?

A. Lesser Koa finch and Nukupuu

B. Akialoa and Ou

C. Kauai akialoa and Maui parrot bill

D. Ou and Greater Koa finch

70. According to the theory of natural selection, why are some individuals more likely than others to survive and reproduce?

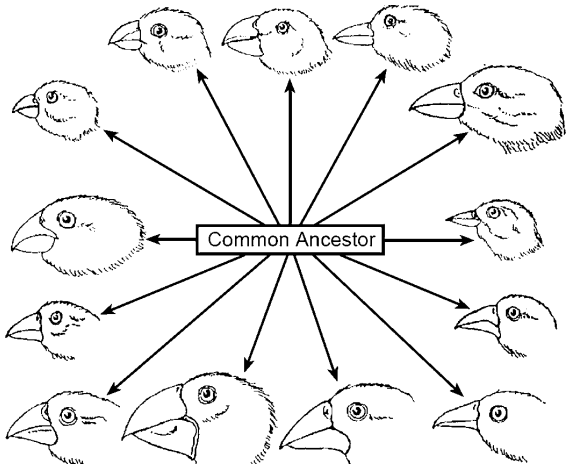
A. Some individuals pass on to their offspring new characteristics they have acquired during their lifetimes.

B. Some individuals are better adapted to exist in their environment than others are.

C. Some individuals do not pass on to their offspring new characteristics they have acquired during their lifetimes.

D. Some individuals tend to produce fewer offspring than others in the same environment.

71. The diversity within the wild bird species in the accompanying diagram can best be explained by which process?



A. natural selection

B. asexual reproduction

C. ecological succession

D. mitotic cell division

72. Which situation would most likely result in the highest rate of natural selection?

A. reproduction of organisms by an asexual method in an unchanging environment

B. reproduction of a species having a very low mutation rate in a changing environment

C. reproduction of organisms in an unchanging environment with little competition and few predators

D. reproduction of organisms exhibiting genetic differences due to mutations and genetic recombinations in a changing environment

73. 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

A. birds do not have the ability to learn

B. individual birds need to learn to survive and reproduce

C. these behaviors helped birds to survive in the past

D. within their lifetimes, birds developed these behaviors

74. Which statement best describes a current understanding of natural selection?

A. Natural selection influences the frequency of an adaptation in a population.

B. Natural selection has been discarded as an important concept in evolution.

C. Changes in gene frequencies due to natural selection have little effect on the evolution of species.

D. New mutations of genetic material are due to natural selection.

75. Which statement is *not* part of the concept of natural selection?

A. Individuals that possess the most favorable variations will have the best chance of reproducing.

B. Variation occurs among individuals in a population.

C. More individuals are produced than will survive.

D. Genes of an individual adapt to a changing environment.

76. Natural selection and its evolutionary consequences provide a scientific explanation for each of the following *except*

A. the fossil record

B. protein and DNA similarities between different organisms

C. similar structures among different organisms

D. a stable physical environment

77. Woolly mammoths became extinct thousands of years ago, while other species of mammals that existed at that time still exist today. These other species of mammals most likely exist today because, unlike the mammoths, they

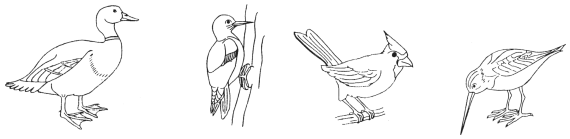
A. produced offspring that all had identical inheritable characteristics

B. did not face a struggle for survival

C. learned to migrate to new environments

D. had certain inheritable traits that enabled them to survive

78. The diagram below represents four different species of wild birds. Each species has feet with different structural adaptations.



The development of these adaptations can best be explained by the concept of

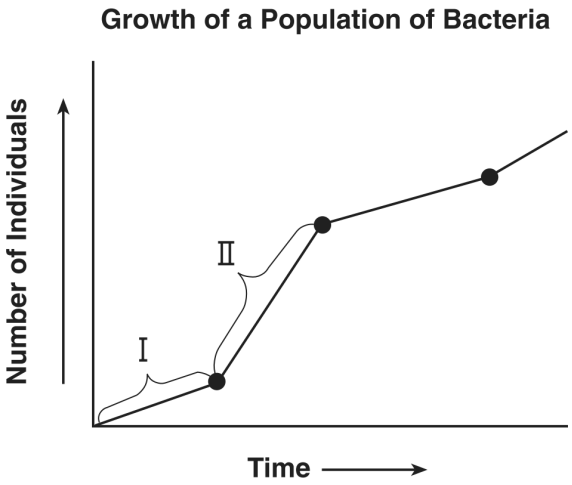
A. inheritance of resistance to diseases that affect all these species

B. inheritance of characteristics acquired after the birds hatched from the egg

C. natural selection

D. selective breeding

79. The graph below shows the growth of a population of bacteria over a period of 80 hours.



Which statement best describes section II of the graph?

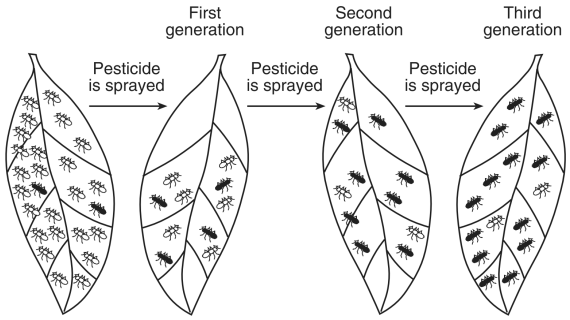
A. The population has reached the carrying capacity of the environment.

B. The rate of reproduction is slower than in section I.

C. The population is greater than the carrying capacity of the environment.

D. The rate of reproduction exceeds the death rate.

80. The diagram below shows the effect of spraying a pesticide on a population of insects over three generations.



Which concept is represented in the diagram?

A. survival of the fittest

B. dynamic equilibrium

C. succession

D. extinction

81. The females of certain species of turtles will sneak into a nest of alligator eggs to lay their own eggs and then leave, never to return. When the baby turtles hatch, they automatically hide from the mother alligator guarding the nest and go to the nearest body of water when it is safe to do so. Which statement best explains the behavior of these baby turtles?

A. More of the turtles' ancestors who acted in this way survived to reproduce, passing this behavioral trait to their offspring.

B. The baby turtles are genetically identical, so they behave the same way.

C. Turtles are not capable of evolving, so they repeat the same behaviors generation after generation.

D. The baby turtles' ancestors who learned to behave this way taught the behaviors to their offspring

82. In an area of Indonesia where the ocean floor is littered with empty coconut shells, a species of octopus has been filmed "walking" on two of its eight tentacles. The remaining six tentacles are wrapped around its body. Scientists suspect that, with its tentacles arranged this way, the octopus resembles a rolling coconut. Local predators, including sharks, seem not to notice the octopus as often when it behaves in this manner. This unique method of locomotion has lasted over many generations due to

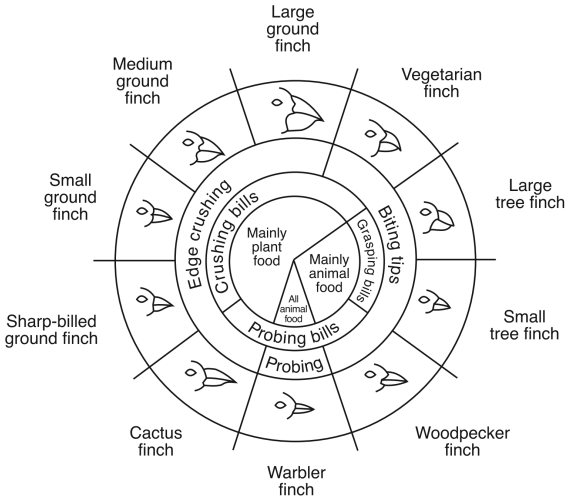
A. competition between octopuses and their predators

B. ecological succession in marine habitats

C. the process of natural selection

D. selective breeding of this octopus species

83. Base your answer(s) to the following question(s) on the diagram below that shows variations in the beaks of finches in the Galapagos Islands and on your knowledge of biology.



From: *Galapagos: A Natural History Guide*

The diversity of species seen on the Galapagos Islands is mostly due to

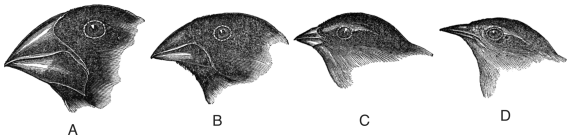
A. gene manipulation by scientists

B. gene changes resulting from mitotic cell division

C. natural selection

D. selective breeding

84. Base your answer(s) to question(s) on the diagram below and on your knowledge of biology. The diagram shows the heads of four different species of Galapagos Islands finches.



The four different types of beaks shown are most likely the result of

A. gene manipulation

B. natural selection

C. unchanging environmental conditions

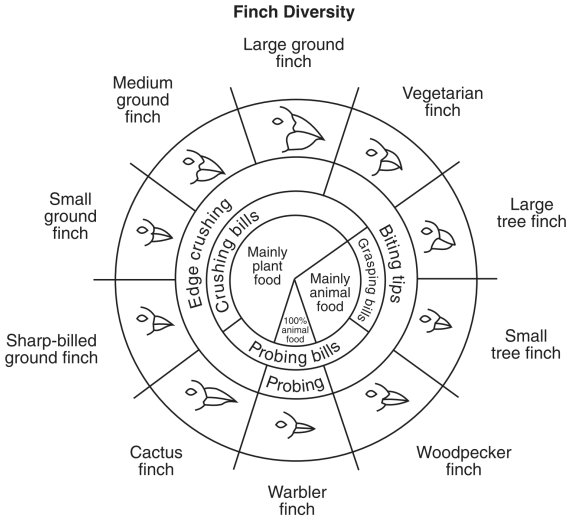
D. patterns of behavior learned from parents

85. The diversity of organisms present on Earth is the result of

A. ecosystem stability B. homeostasis

C. natural selection D. direct harvesting

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



—From *Galapagos: A Natural History Guide*

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

A. asexual reproduction of these finch species

B. the selection for different shaped beaks that best suit different niches

C. the genetic recombination associated with mitotic cell division

D. the genetic engineering of the DNA of each of these species

87. Ancestors of the giant panda had rounded paws with five very short toes. Today, the giant panda has a sixth toe, often referred to as a thumb, even though it develops from a wrist bone. This unique thumb is an adaptation that allows the panda to easily hold and eat bamboo shoots. The presence of the giant panda's thumb is most likely the result of

A. natural selection

B. selective breeding

C. asexual reproduction

D. ecological succession

88. A species of bird known as Bird of Paradise has been observed in the jungles of New Guinea. The males shake their bodies and sometimes hang upside down to show off their bright colors and long feathers to attract females. Females usually mate with the "flashiest" males. These observations can be used to support the concept that

A. unusual courtship behaviors lead to extinction

B. some organisms are better adapted for asexual reproduction

C. homeostasis in an organism is influenced by physical characteristics

D. behaviors that lead to reproductive success have evolved

89. Studies of the finches of the Galapagos Islands have shown that

A. DNA will change to produce structures needed by birds to survive intense competition

B. a bird's beak changes annually in response to the type of food that is most abundant each year

C. natural selection occurs when there are scarce resources and intense competition

D. the beak of a finch will change if the environment of the bird remains stable

90. Buffalo grass is a species of plant found on the grazing prairies of Wyoming. It is a tough grass that has silicates (compounds containing oxygen and silicon) that reinforce its leaves. For hundreds of years, this grass has survived in an adverse environment. Which statement best explains the presence of this grass today?

A. There are no variations in this grass species that help it to survive in an adverse environment.

B. Silicates are necessary for photosynthesis.

C. The current species has no mutations.

D. The silicates in the grass have given the species an advantage in its environment.

91. The table below shows adaptations in two organisms.

Enviromental Adaptations

Organism	Enviroment	Adaptation
desert rat	hot and dry	comes out of burrow only at night
Arctic Poppy plant	cold and windy	grows low to ground next to rocks

The presence of these adaptations is most likely the result of

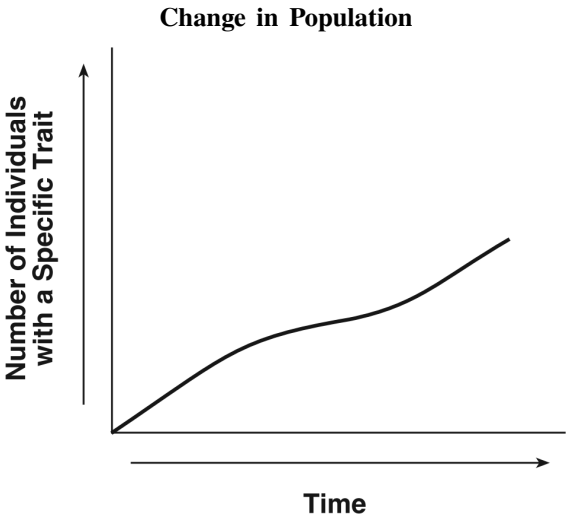
A. reproductive technology

B. natural selection

C. asexual reproduction

D. human interference

92. The graph below shows the changes in the number of individuals in a population who have a specific trait.



Which statement concerning this trait is a valid inference?

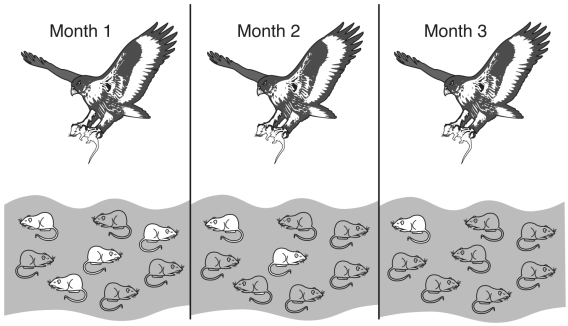
A. As time passed, an increasing number of individuals with this trait survived and reproduced.

B. Individuals can acquire new survival characteristics over time and pass them on to their offspring.

C. The longer a species is in an environment, the less likely it is that mutations will occur within the species.

D. The number of traits a species possesses has a direct relationship to the amount of time the species will exist.

93. The diagram below represents the same field of mice hunted by a hawk over a period of three months.



The overall changes in the population of mice can be explained best by

A. natural selection
B. succession
C. reproduction
D. mouse extinction

94. Some variation must be present in a population in order for natural selection to take place. These variations arise from mutations in the DNA and

A. sorting of chromosomes during sexual reproduction

B. combining of chromosomes during organ development

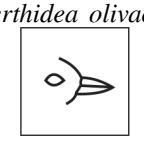
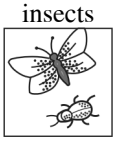
C. changing of chromosomes during cloning

D. removal of chromosomes during selective breeding

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

The Galapagos Islands are home to many different species of finches. Three finch species, their relative beak sizes, and their food preferences are represented below. All three species live on the same island.

Three Galapagos Finches and Their Sources of Nutrition

Name	Foods
Vegetarian finch *Platyspiza crassirostris* 	Buds, leaves, fruit of trees 
Warbler finch *Certhidea olivacea* 	Flying and ground-dwelling insects 
Cactus finch *Geospiza scandens* 	Cactus flowers and nectar 

95. Which process allows for the evolution of finches over time?

A. natural selection

B. selective breeding

C. asexual reproduction

D. ecological succession

96. Which statement describes an effect of natural selection on a species?

A. It favors the survival of certain members of the species and results in a change in the proportion of individuals with highly adaptive traits.

B. It provides feedback mechanisms for members of a species and results in a change in the proportion of individuals with homeostatic controls.

C. It leads to reproduction with other species, increasing the number of different adaptations.

D. It increases competition between populations that occupy different niches, increasing the chance of extinction of the less-adapted species.

Causes of Biodiversity/Speciation 5/2/2019

1.
Answer: D

2.
Answer: A

3.
Answer: C

4.
Answer: A

5.
Answer: A

6.
Answer: A

7.
Answer: D

8.
Answer: B

9.
Answer: C

10.
Answer: C

11.
Answer: C

12.
Answer: B

13.
Answer: B

14.
Answer: B

15.
Answer: C

16.
Answer: A

17.
Answer: A

18.
Answer: C

19.
Answer: D

20.
Answer: B

21.
Answer: D

22.
Answer: C

23.
Answer: A

24.
Answer: B

25.
Answer: B

26.
Answer: C

27.
Answer: D

28.
Answer: D

29.
Answer: D

30.
Answer: D

31.
Answer: A

32.
Answer: B

33.
Answer: C

34.
Answer: C

35.
Answer: D

36.
Answer: D

37.
Answer: B

38.
Answer: B

39.
Answer: B

40.
Answer: B

41.
Answer: B

42.
Answer: C

43.
Answer: C

44.
Answer: B

45.
Answer: D

46.
Answer: A

47.
Answer: A

48.
Answer: C

49.
Answer: B

50.
Answer: C

51.
Answer: A

52.
Answer: D

53.
Answer: A

54.
Answer: B

55.
Answer: A

56.
Answer: A

57.
Answer: D

58.
Answer: A

59.
Answer: D

60.
Answer: C

61.
Answer: A

62.
Answer: B

63.
Answer: B

64.
Answer: D

65.
Answer: C

66.
Answer: A

67.
Answer: D

68.
Answer: C

69.
Answer: D

70.
Answer: B

71.
Answer: A

72.
Answer: D

73.
Answer: C

74.
Answer: A

75.
Answer: D

76.
Answer: D

77.
Answer: D

78.
Answer: C

79.
Answer: D

80.
Answer: A

81.
Answer: A

82.
Answer: C

83.
Answer: C

84.
Answer: B

85.
Answer: C

86.
Answer: B

87.
Answer: A

88.
Answer: D

89.
Answer: C

90.
Answer: D

91.
Answer: B

92.
Answer: A

93.
Answer: A

94.
Answer: A

95.
Answer: A

96.
Answer: A