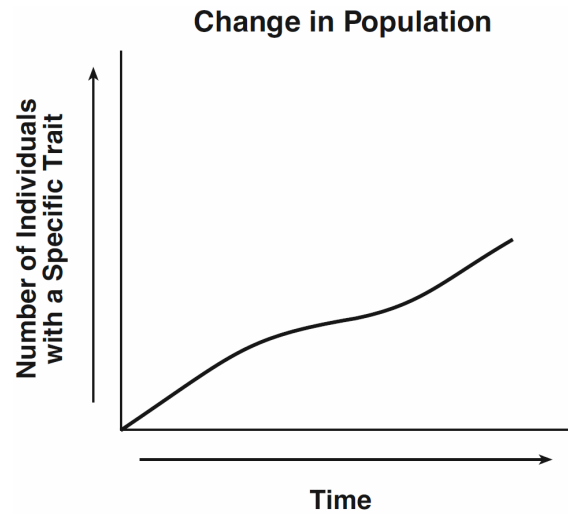


1. As a result of habitat destruction, the size of the Florida panther population has been drastically reduced. It is estimated that there are only 100 to 160 Florida panthers in the wild. Which statement best explains why the Florida panther population may *not* continue to evolve?
 - A) There is no longer a chance of mutations occurring in the population.
 - B) There is a lack of competition for limited environmental resources.
 - C) There is no longer a chance of a trait providing a reproductive advantage to the population.
 - D) There is a lack of genetic variation for selection to act upon.
2. 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
3. A gene pool consists of
 - A) all the genes that mutate in a single generation
 - B) all the heritable genes for traits in a population
 - C) all the gametes produced by a population
 - D) the mutated alleles for a particular trait

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

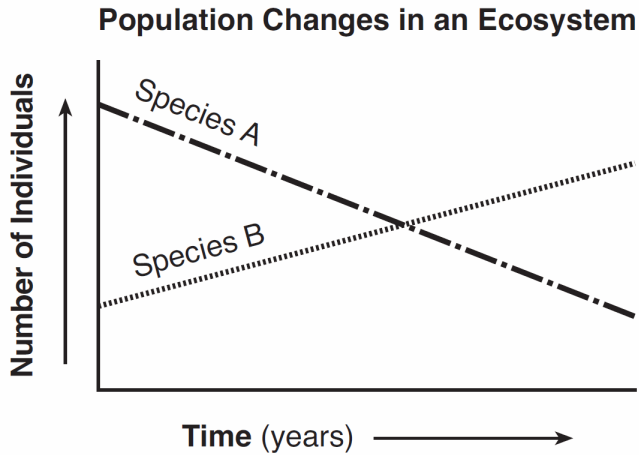


Which statement concerning this trait is a valid inference?

- 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.
5. A major factor in changing the frequencies of the genes in the gene pool of a population is
 - A) domestication
 - B) migration
 - C) asexual reproduction
 - D) random mating
6. Evolution can occur at different rates; however, for evolution to occur, there must be
 - A) variations within a species
 - B) extinction of the species
 - C) asexual reproduction
 - D) no change in the genes of an organism

Unit 6 - Evolution

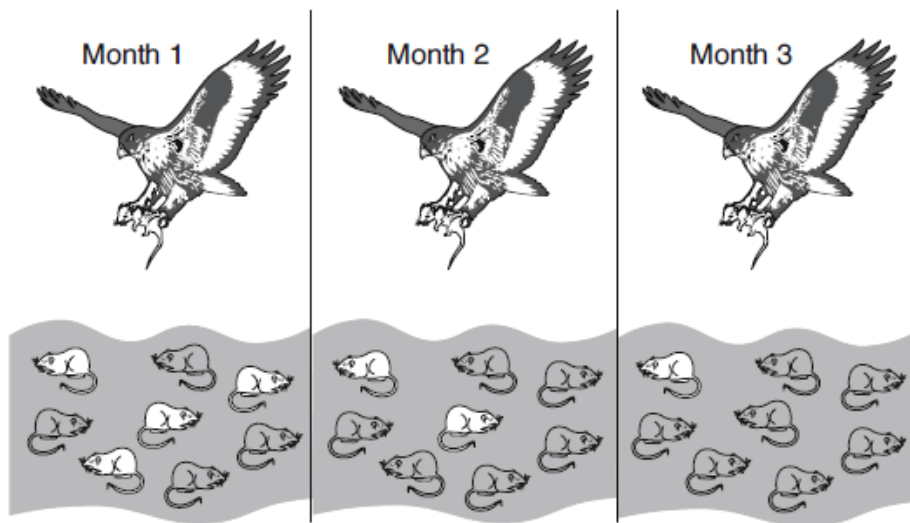
7. In order for a species to evolve, it must be able to
- A) consume a large quantity of food
 - B) reproduce successfully
 - C) maintain a constant body temperature
 - D) be domesticated
8. The graph below represents the populations of two different species in an ecosystem over a period of several years.



Which statement is a possible explanation for the changes shown?

- A) Species *A* is better adapted to this environment.
 - B) Species *A* is the predator of Species *B*.
 - C) Species *B* is better adapted to this environment.
 - D) Species *B* is a parasite that has benefited species *A*.
-
9. 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
10. Many scientists believe that the earliest cells on Earth were relatively simple, lacking nuclear membranes and other organized cellular structures. Over time, more complex cells developed from these simple cells.
- These statements describe the concept of
- A) inheritance of acquired characteristics
 - B) evolution
 - C) dominance
 - D) use and disuse

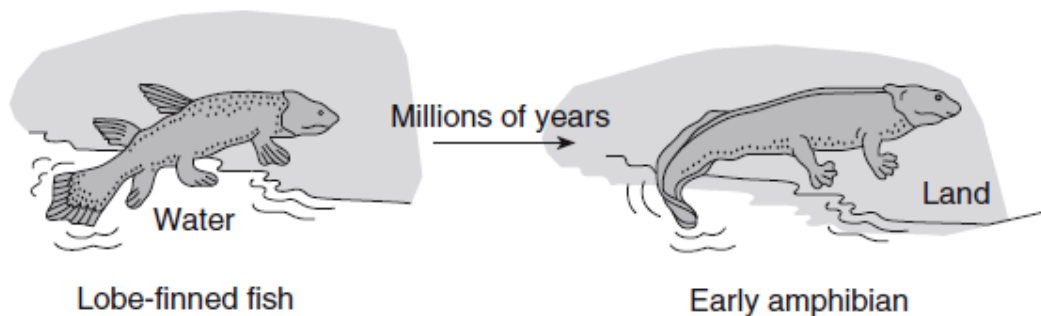
11. The diagram below represents the same field of mice hunted by a hawk over a period of three months.



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

- A) natural selection
- B) succession
- C) reproduction
- D) mouse extinction

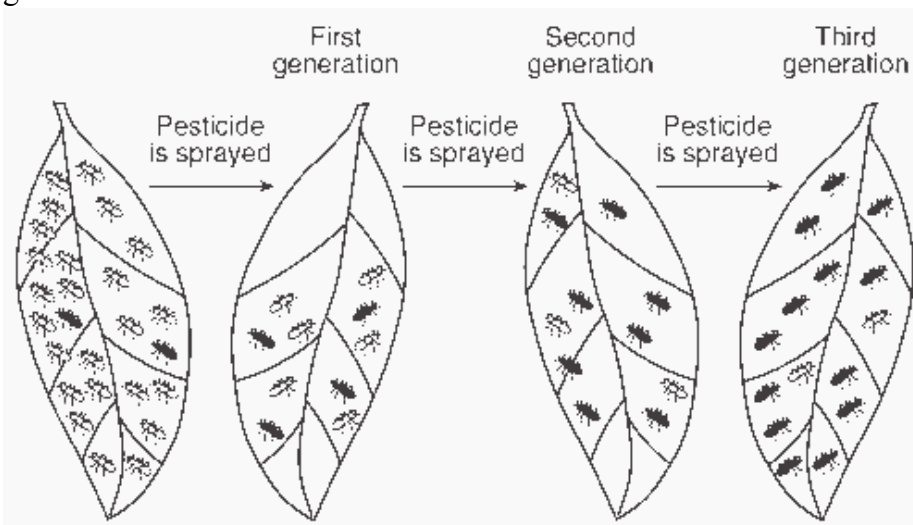
12. The diagram below represents one possible evolutionary change that could have led lobe-finned fish to develop into the first amphibians. Amphibians are animals that live on land some of their life.



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

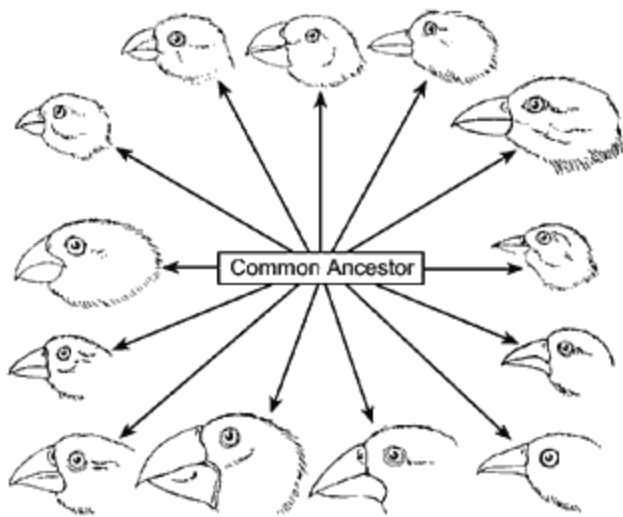
- A) a sudden mutation that changed the gills of the lobe-finned fish to lungs
- B) increased competition between animals that had adapted to living on the land
- C) the need to move to land because of increased competition for food in the ocean
- D) variations among offspring, followed by natural selection

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



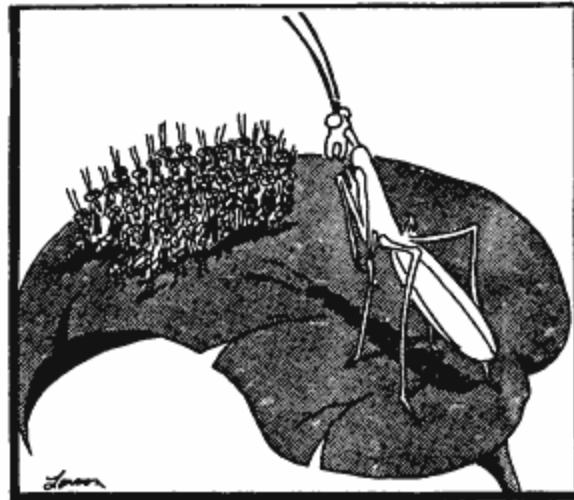
Which concept is represented in the diagram?

- A) survival of the fittest
B) dynamic equilibrium
C) succession
D) extinction
14. The diversity within the wild bird species in the diagram below can best be explained by which process?



- A) natural selection
B) asexual reproduction
C) ecological succession
D) mitotic cell division

15. Which evolutionary concept is best illustrated by the cartoon below?



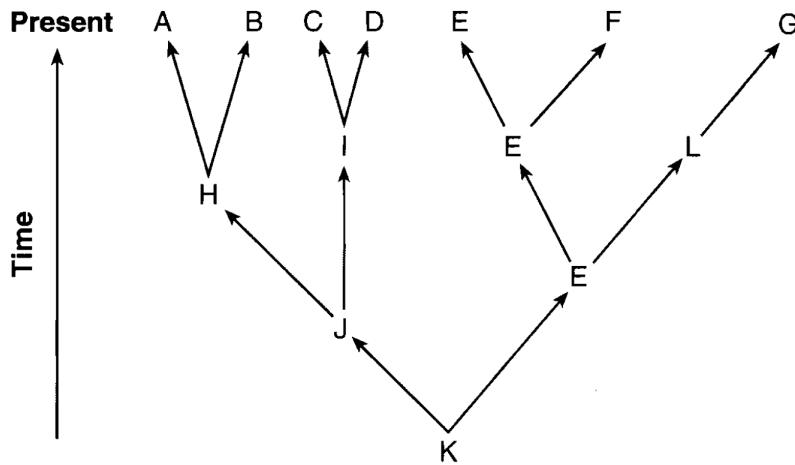
- A) production of mutations
B) use and disuse
C) survival of the fittest
D) speciation

Unit 6 - Evolution

16. Antibiotics are substances used to help fight an infection of *Streptococcus*, a bacterium that causes strep throat. Overuse of these antibiotics can

- A) prevent future infections by these pathogens
- B) cause a decrease in the production of enzymes
- C) allow organic molecules to be synthesized
- D) select for resistant organisms

17. The evolutionary pathways of several species are represented in the diagram below.



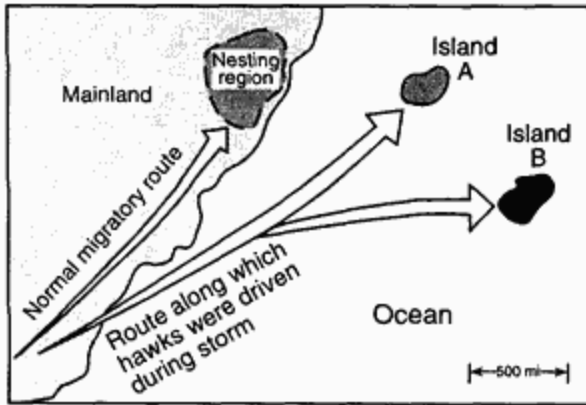
Which species was best adapted for survival in changing environmental conditions?

- A) *A*
- B) *E*
- C) *K*
- D) *L*

18. If only one type of tree is planted in an abandoned field, the ecosystem will

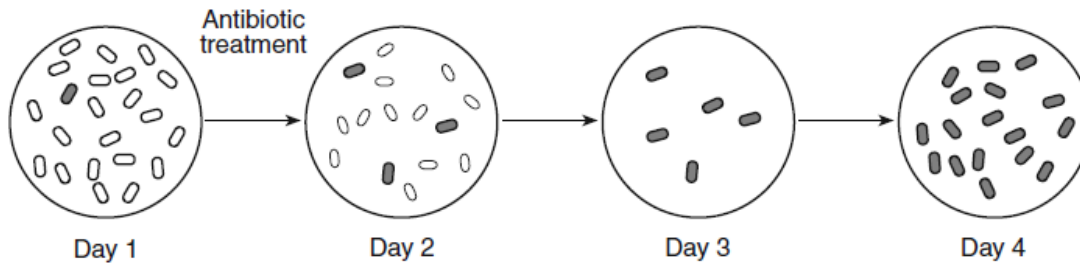
- A) evolve quickly and become extinct
- B) be unable to reach dynamic equilibrium
- C) contain little genetic variability
- D) be unable to cycle materials

19. 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 environment of island A is very similar to the hawk's original nesting region. The environment 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 than those on island A.
 - B) The hawks that landed on island A have evolved more than those on island B.
 - C) The populations on islands A and B have undergone identical mutations.
 - D) The hawks on island A have given rise to many new species.
20. Based on modern evolutionary theory, the development of a new species would most likely be associated with
- A) a constant environment
 - B) stable gene pools
 - C) geographic isolation
 - D) a lack of mutations

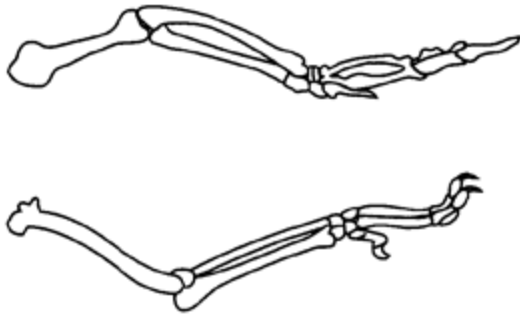
21. The diagram below represents some changes that took place in a bacterial population recently exposed to an antibiotic.



Which statement would best explain the presence of bacteria on day 4?

- A) A bacterial population cannot survive exposure to antibiotics.
 - B) This bacterial population cannot survive exposure to this antibiotic.
 - C) Bacteria can change whenever it is necessary to survive antibiotic treatment.
 - D) Some of the bacterial population was resistant to this antibiotic.
-

22. The diagram below represents the bones of the forelimbs of two animals alive today that most likely evolved from a common ancestor. Members of the original ancestral population were isolated into two groups by natural events.



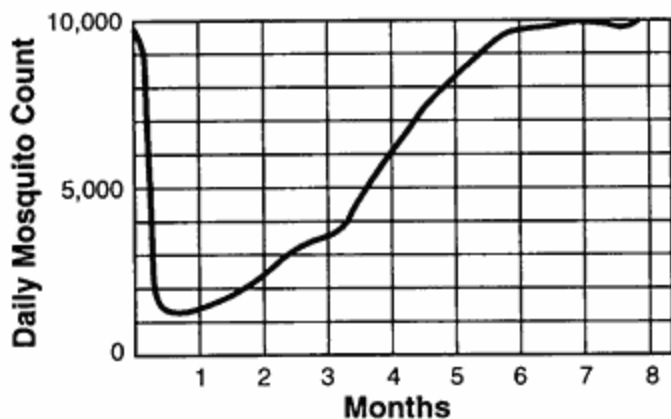
If these two animals did have a common ancestor, which statement would best explain why there are differences in the bones?

- A) Changes occurred to help the animals return to their original environment.
- B) Changes contributed to the survival of the organisms in their new environment.
- C) Changes helped reduce competition within each group.
- D) Changes indicate the species are evolving to be more like the ancestral species.

Unit 6 - Evolution

Base your answers to questions 23 and 24 on the information and graph below and on your knowledge of biology.

A small community that is heavily infested with mosquitoes was sprayed weekly with the insecticide DDT for several months. Daily counts providing information on mosquito population size are represented in the graph below.



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

- A) The weather in early summer was probably cool.
- B) Most of the mosquitoes were of reproductive age.
- C) Environmental factors varied slightly as the summer progressed.
- D) Natural variation existed within the population.

24. What is the most probable reason for the decreased effectiveness of the DDT?

- A) DDT caused mutations in
- B) DDT was only sprayed once.
- C) Mosquitoes resistant to DDT lived and produced offspring.
- D) DDT chemically reacted with the DNA of the mosquitoes.

25. 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

26. Which organic compounds would be the best to analyze in order to determine if two species are closely related?

- | | |
|-----------|-------------|
| A) fats | B) starches |
| C) sugars | D) proteins |

27. In 2007, scientists broke open a fossil of a dinosaur bone and found some preserved tissues. Analysis showed that some proteins in these tissues are very similar to proteins found in modern chickens. The conclusion that these dinosaurs are related to modern chickens is based on
- A) molecular similarities
 - B) natural selection
 - C) similarities in behavior
 - D) the occurrence of mutations
28. A researcher recently discovered a new species of bacteria in the body of a tubeworm living near a hydrothermal vent. He compared the DNA of this new bacterial species to the DNA of four other species of bacteria. The DNA sequences came from the same part of the bacterial chromosome of all four species.

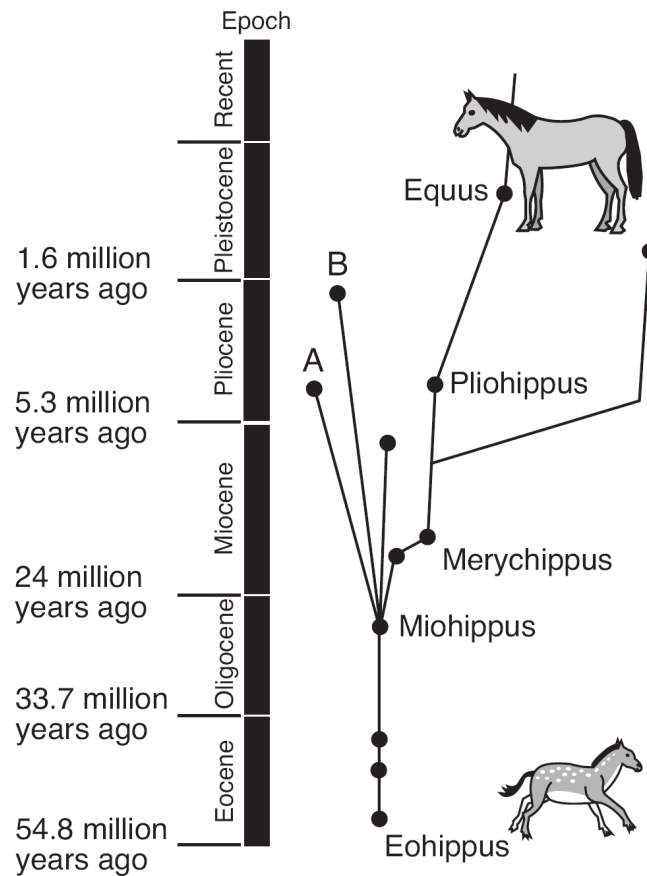
Species	DNA Sequence
unknown species	ACT GCA CCC
species I	ACA GCA CCG
species II	ACT GCT GGA
species III	ACA GCA GGG
species IV	ACT GCA CCG

According to these data, the unknown bacterial species is most closely related to

- A) species I
- B) species II
- C) species III
- D) species IV

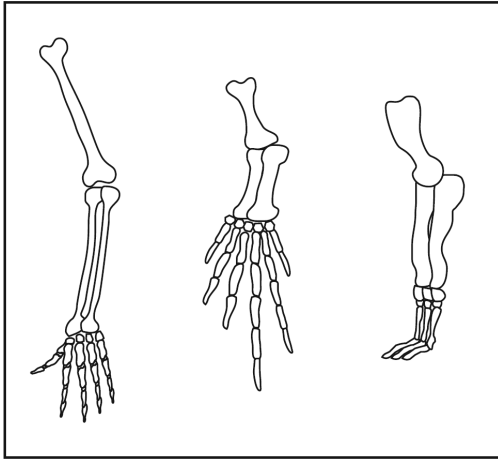
Unit 6 - Evolution

Base your answers to questions 29 and 30 on the diagram below, which represents possible relationships between animals in the family tree of the modern horse, and on your knowledge of biology.



29. *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
30. 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

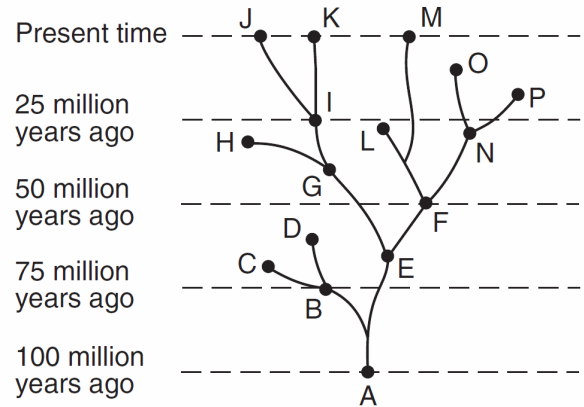
31. The diagram below represents the bone arrangements in the front limbs of three different species of mammals.



The similarities and differences in these limbs suggest that all three species developed from the same ancestor, but

- A) produced different numbers of offspring
 - B) lived in different time periods
 - C) adapted to different habitats
 - D) migrated to similar habitats
32. A scientist at a large natural history museum has a collection of fossils that were found throughout the world. Only a few of the fossils represent species that are still alive on Earth today. One reason for this is that
- A) most of the species that have ever lived on Earth are alive today.
 - B) most of the species that have ever lived on Earth are extinct
 - C) fossils of only extinct species have been found
 - D) species alive today will not form any fossils for future discovery by scientists

33. Base your answer to the following question on the diagram below and on your knowledge of biology. The diagram represents possible evolutionary pathways of certain organisms.



Which statement can best be inferred based on the information in the diagram?

- A) Natural selection occurs only as a result of mutations.
- B) Natural selection requires a minimum of 5 million years to occur.
- C) Each new species that develops continues to exist through present time.
- D) Some species that are no longer successful in their environment may become extinct.