Evolution 3 Star

Name: _____ **Date:** _____

1. 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

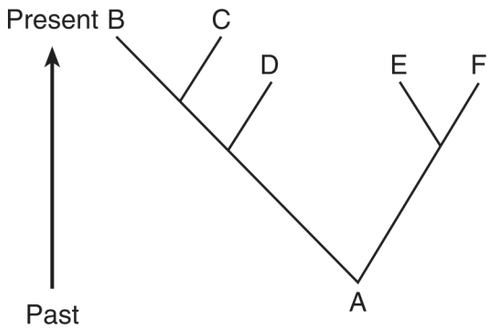
   A. molecular similarities

   B. natural selection

   C. similarities in behavior

   D. the occurrence of mutations

2. A diagram of evolutionary pathways of various animal species is shown below.



   The pattern of these evolutionary pathways is most likely the result of alterations within which structure?

   A. vacuole B. cell membrane

   C. nucleus D. ribosome

3. Base your answer to the following question on the chart below and on your knowledge of biology.

A	B	C
The diversity of multicellular organisms increases.	Simple, single-celled organisms appear.	Multicellular organisms begin to evolve.

   According to most scientists, which sequence best represents the order of biological evolution on Earth?

   A. A → B → C B. B → C → A

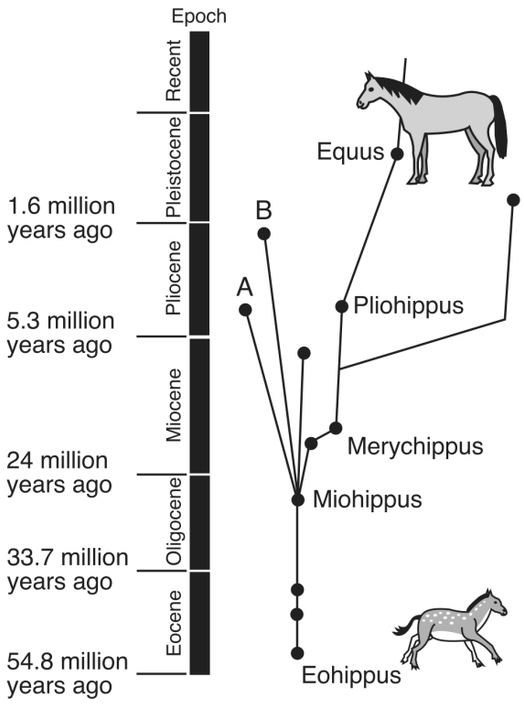
   C. B → A → C D. C → A → B

4. The chart below contains a number of characteristics for three different organisms. The characteristics can be used in classifying these organisms.

Characteristics	Organism A	Organism B	Organism C
Number of cells	unicellular	multicellular	unicellular
Type of nutrition	autotrophic	autotrophic	heterotrophic
Nuclear membrane	absent	present	absent
DNA	present	present	present

   Which *two* organisms would be expected to have the most similar genetic material? Support your answer using information from the chart.

5. 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

6. *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

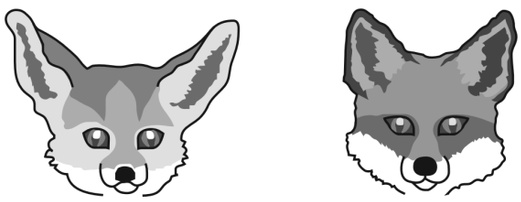
   A. *Eohippus* inhabited grassland areas throughout the world

   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

7. 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.

8. The characteristics of four finches that inhabit the same island are represented in the chart below.

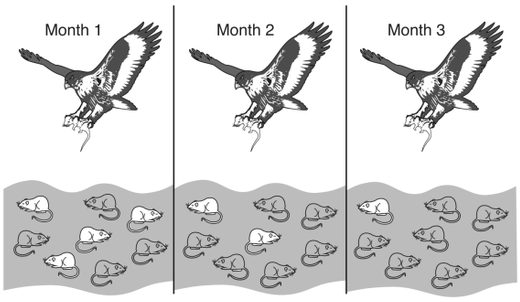
Characteristics Chart

Large Ground Finch  Beak: crushing Food: mainly plant	Warbler Finch  Beak: probing Food: 100% animal
Small Ground Finch  Beak: crushing Food: mainly plant	Large Tree Finch  Beak: grasping Food: mainly animal

Complete the table below using information in the characteristics chart and your knowledge of biology.

Competes With the Large Tree Finch	Type of Finch	State *one* reason why it competes *or* does *not* compete with the large tree finch.
no		
yes		

9. 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

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

In addition to their use for hearing, ears contain many blood vessels that allow heat to escape into the air. Animals that live in warm climates tend to have ears with large areas exposed to the environment. Animals in cold climates have a more compact ear that keeps exposure to the environment to a minimum. The photographs below show a jackrabbit from desert regions of the southwestern United States and a fennec fox from northern Africa with large ears, and a snowshoe hare and an arctic fox with small ears.

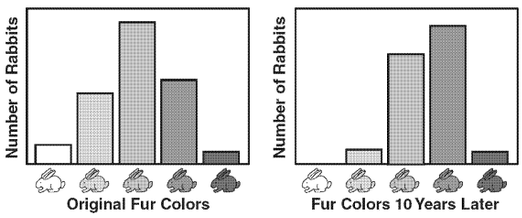
Discuss how differences in ear size in these organisms might have occurred.

Explain how the size of these animals' ears can help the animals survive in their environment.

11. Identify *one* process that most likely resulted in the animals in warm climates having large ears, while animals in cold climates have small ears.

12. State how the overproduction of offspring in each species for many generations contributed to the presence of different ear sizes.

13. 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

14. 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

15. 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?

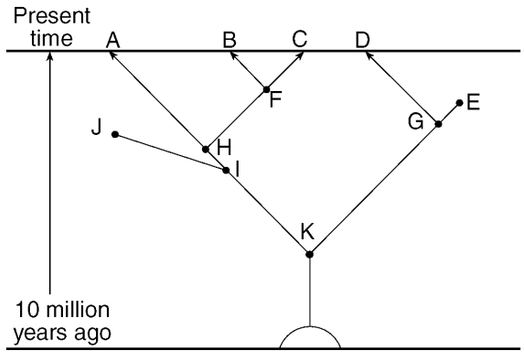
A. The evolution of the two populations will be identical.

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.

16. Base your answer(s) to the following question(s) on the diagram and on your knowledge of biology. The diagram shows an interpretation of relationships based on evolutionary theory. The letters represent different species.



Explain why species *B* and *C* are more closely related than species *A* and *C* are.

17. The diagram indicates that a common ancestor for species *C* and *E* is species

A. *F* B. *G* C. *H* D. *K*

18. Which species are least likely to be vital parts of a present-day ecosystem?

A. *A* and *E* B. *C* and *D*

C. *E* and *J* D. *B* and *F*

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

A student observed the physical characteristics of seven organisms and prepared the data table below.

Organism Comparison

Organism	Internal Skeleton Present	Legs Present	Wings Present	Fur Present	Moist Body Covering Present
Earthworm	no	no	no	no	yes
Fish	yes	no	no	no	yes
Fly	no	yes	yes	no	no
Gorilla	yes	yes	no	yes	no
Jellyfish	no	no	no	no	yes
Parrot	yes	yes	yes	no	no
Snake	yes	no	no	no	no

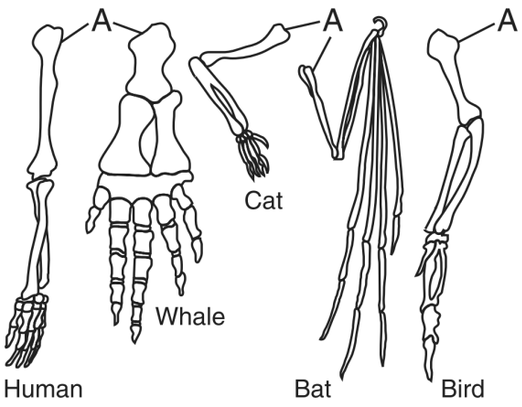
One of the student's classmates sorted the seven organisms into two groups as shown below.

Group 1	Group 2
fly parrot	earthworm gorilla snake fish jellyfish

Another classmate suggested that the earthworm is more closely related to the jellyfish than to any other organism observed. State the evidence from the data table that the student most likely used for this suggested relationship.

20. Fish and snakes are very different organisms, yet they have many similarities. Provide a biological explanation for the fact that fish and snakes have so many characteristics in common.

21. Base your answer to the following question on the diagram below and on your knowledge of biology.



The similarities of the bones labeled *A* provide evidence that

A. the organisms may have evolved from a common ancestor

B. all species have one kind of bone structure

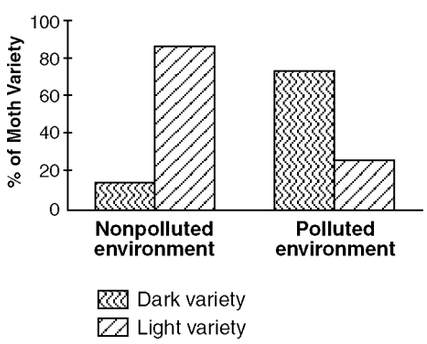
C. the cells of the bones contain the same type of mutations

D. all structural characteristics are the same in animals

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

Color in peppered moths is controlled by genes. A light-colored variety and a darkcolored variety of a peppered moth species exist in nature. The moths often rest on tree trunks, and several different species of birds are predators of this moth.

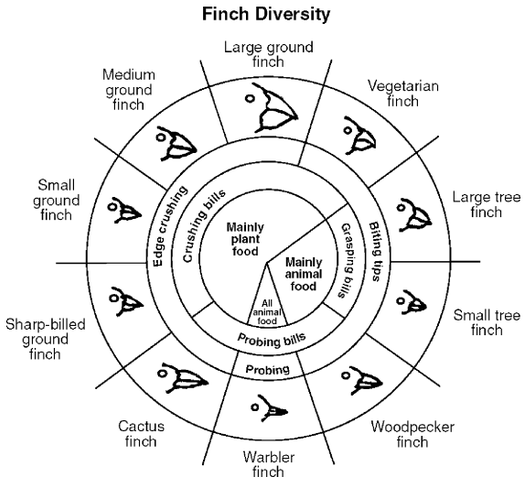
Before industrialization in England, the light-colored variety was much more abundant than the dark-colored variety and evidence indicates that many tree trunks at that time were covered with light-colored lichens. Later, industrialization developed and brought pollution which killed the lichens leaving the tree trunks covered with darkcolored soot. The results of a study made in England are shown below.



State *one* possible reason that a larger number of the dark-colored variety were present in the polluted environment.

23. State *one* possible reason that the light-colored variety was not completely eliminated from the polluted environment.

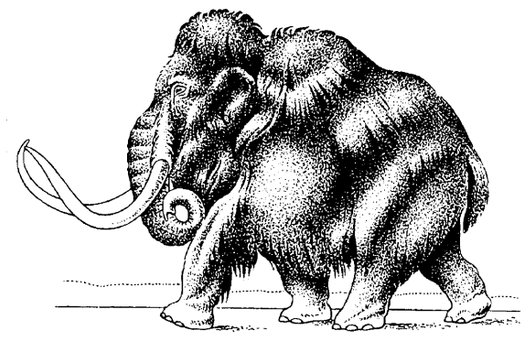
24. Base your answer(s) to the following question(s) on the finch diversity chart below, which contains information concerning the finches found on the Galapagos Islands.



Identify *one* bird that would most likely compete for food with the large tree finch. Support your answer.

25. Identify *one* trait, other than beak characteristics, that would contribute to the survival of a finch species and state one way this trait contributes to the success of this species.

26. The accompanying diagram represents a woolly mammoth, a relative of the modern elephant. Woolly mammoths lived during the Ice Age and eventually became extinct.



State *one* possible reason this species died out.

Evolution 3 Star 03/17/2015

1.
Answer: A

2.
Answer: C

3.
Answer: B

4.
Answer: A and C would probably have the most similar genetic material. A and C have more of the given characteristics in common than any other pair.

5.
Answer: D

6.
Answer: B

7.
Answer: B

8.
Answer:

Competes With the Large Tree Finch	Type of Finch	State *one* reason why it competes *or* does *not* compete with the large tree finch.
no	large/small ground finch or warbler finch	The large tree finch eats mainly animal food, while the large/small ground finch eats mainly plant food. or The warbler finch may eat different animals.
yes	warbler finch	They both eat animal food.

9.
Answer: A

10.
Answer: Large ears can help an animal remove excess heat in a warm environment, which helps the animal maintain a stable internal temperature.

The small ears in the arctic fox help minimize heat loss in its cold environment.

The large ears in the jackrabbit let excess heat escape, helping it stay cool.

Large ears would allow animals to hear predators.

11.
Answer: natural selection

evolution

mutation

recombination

12.
Answer: When there is overproduction, not all can live, so natural selection results in the survival of the fittest in each generation.

With more offspring, only some survive and pass on their traits, resulting in changes in the species over time.

Overpopulation leads to an increase in the number of variations in a population.

With more individuals, more variations might occur.

13.
Answer: B

14.
Answer: B

15.
Answer: C

16.
Answer: Species *B* and *C* have a common ancestor (*F*) that is more recent than the common ancestor (*H*) of species *A* and *C*.

17.
Answer: D

18.
Answer: C

19.
Answer: Earthworm and jellyfish have all (or the most) observed characteristics in common.

20.
Answer: They may have a common ancestor. OR Both snakes and fish have similar DNA.

21.
Answer: A

22.
Answer: Dark-colored moths were better camouflaged from predators in the polluted environment. OR Dark-colored moths were better adapted for survival on the darker tree bark.

23.
Answer: Dark-colored moths may be carriers of a gene for light color. OR Some light-colored moths may have migrated in from other areas. OR Some light-colored moths may have other adaptations that are more important than color for survival. OR Some light-colored moths may have rested in areas other than the bark.

24.
Answer: Woodpecker finch—they use the same food resources

Small tree finch—both eat mainly animal food

25.
Answer: Faster or more aggressive birds get to seeds faster. OR Larger or stronger birds compete successfully. OR Coordination helps an individual avoid predators.

26.
Answer: The environment changed and the woolly mammoth could no longer adapt. or The number of herbivores increased 10,000 years ago and there was more competition for food. or increase in predators or overhunting by humans