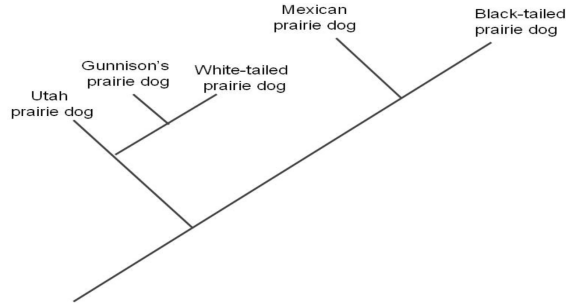


## Evidence For Evolution

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. The figure below shows the classification of several types of prairie dogs.

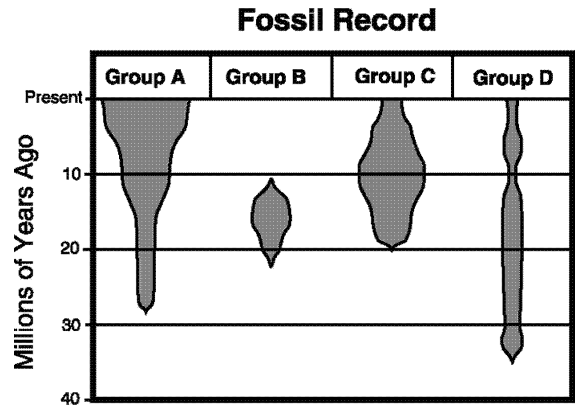


Which of the following statements is *best* supported by the classification in this figure?

- A. The Utah prairie dog was the ancestor of the Gunnison's prairie dog.
  - B. The White-tailed prairie dog evolved from the Black-tailed prairie dog.
  - C. The Mexican prairie dog and the Utah prairie dog share a common ancestor.
  - D. The Mexican prairie dog is the closest relative of the White-tailed prairie dog.
2. Skeletal structures are common between two animals of different species. These structures probably exist because both species
- A. have a common food source.
  - B. live in the same environment.
  - C. have survived until the present time.
  - D. are related to a common ancestor.

3. **Fossil Record**

In a section of the Grand Canyon, scientists have found the fossil remains of several different groups of organisms. The diagram below represents the number and age of the fossils the scientists found. The width of each shaded area in the diagram below indicates the relative number of fossils found.



The scientists hypothesize that the four groups of fossilized organisms originated from a common ancestor. Which of the following would provide the best evidence that their hypothesis is correct?

- A. The number of fossils found in each group is similar.
- B. Present-day members of the groups live in the same environment.
- C. Fossils from each group were found in the same rock layer.
- D. Members of the groups have similar physical structures.

4. Which statement describes the *best* evidence that two species share a recent common ancestor?
- A. The species are about the same size.
  - B. The species eat the same type of food.
  - C. The species live in the same ecosystem.
  - D. The species have similar DNA sequences.

5. Sharks and turtles have many similarities in their proteins.
- What does this suggest about these animals?
- A. They have the same number of chromosomes.
  - B. They have identical DNA sequences.
  - C. They have a common ancestor.
  - D. They are becoming more alike.

6. One piece of evidence that supports the modern theory of evolution is the presence of similar structures that serve different functions in different organisms.



**Human Arm**



**Bat Wing**



**Insect Leg**



**Human Leg**



**Bird Wing**



**Insect Wing**



**Lizard Claw**

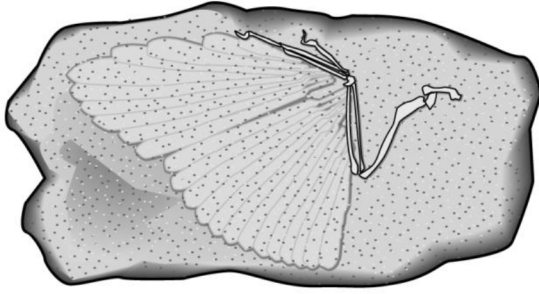


**Bird Beak**





Which pair of features shown are similar structures that are serving different functions?

- A. Human arm and bat wing
- B. Insect leg and human leg
- C. Bird wing and insect wing
- D. Lizard claw and bird beak

7. The picture below shows a fossil of a body section.















Which of the following is most similar to the body section shown above?

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

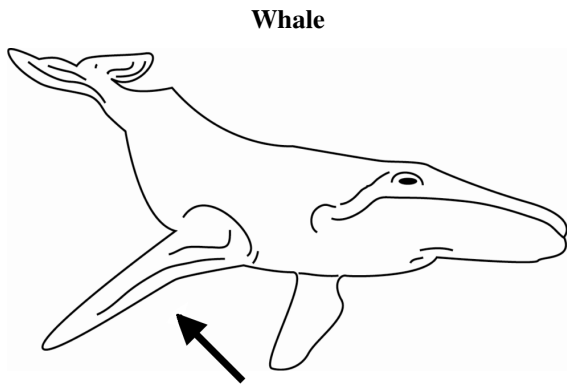
8. The theory that all living organisms share a common ancestry is supported by evidence that they all

- A. have similar cellular chemical processes.
- B. obtain and use energy in the same ways.
- C. have cells with strong membranes.
- D. have circulatory systems to distribute oxygen and carbon dioxide.

9. Which group of living things shares the *most* characteristics?

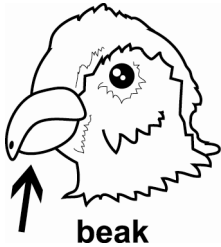
- A.     
Cat Dog Rabbit
- B.     
Fish Crab Crayfish
- C.     
Bird Butterfly Bat
- D.     
Spider Grasshopper Worm

10. Use the picture below to answer the question.

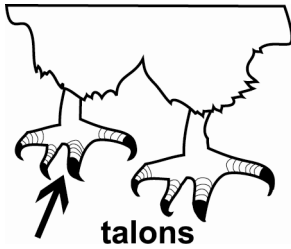


Look where the arrow is pointing on the whale.  
What part of a bird is most similar to this part of the whale?

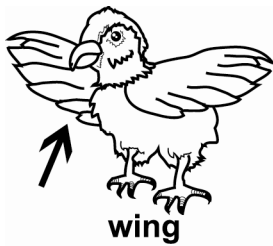
A.



B.



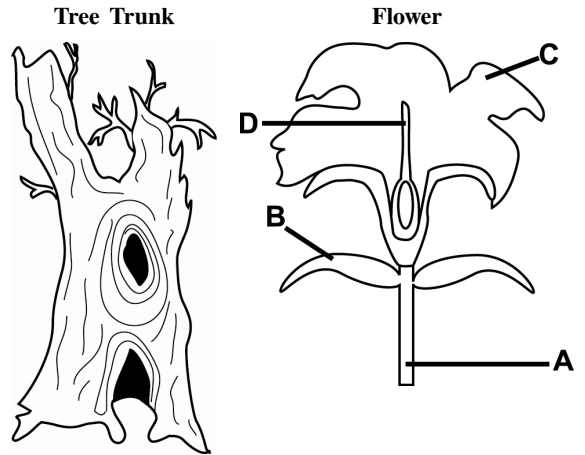
C.



D.



11. Use the pictures below to answer the question.



What part of the flower is most similar in use to the tree trunk?

A. part A

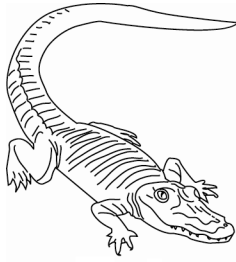
B. part B

C. part C

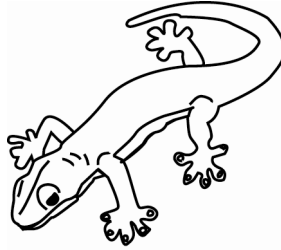
D. part D

12. Use the three pictures of related animals below to answer the question.

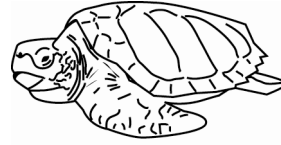
**Related Animals**



**alligator**

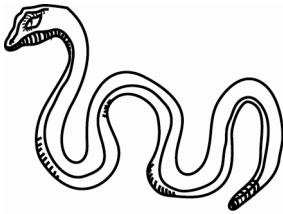


**lizard**



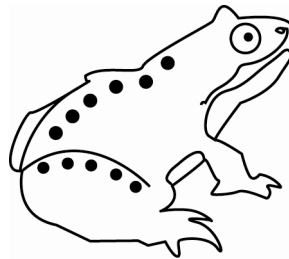
**turtle**

Which animal is *most* closely related to the animals in the pictures above?



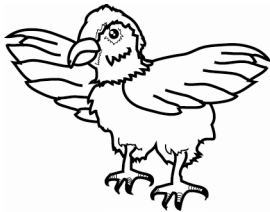
A.

**snake**



B.

**frog**



C.

**bird**

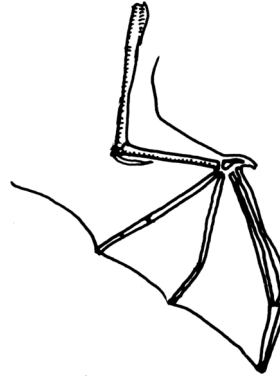


D.

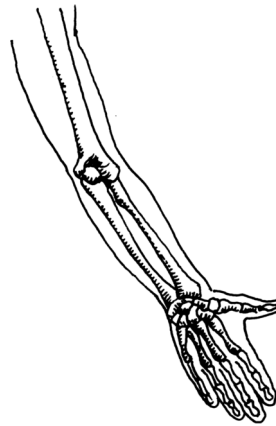
**catfish**

13. Which is the *best* evidence that two species have a common ancestor?
- A. The two species have the same diet.
  - B. The two species live in the same habitat.
  - C. The two species' DNA sequences are 90% identical.
  - D. The two species' skeletal structures are 90% identical.

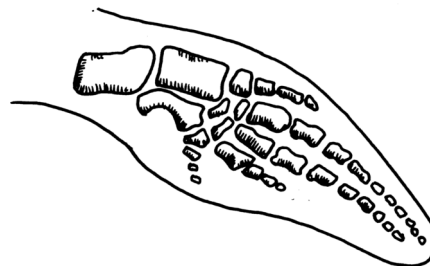
14. The pictures below show bone structures in three animals.



Bat Wing



Human Arm

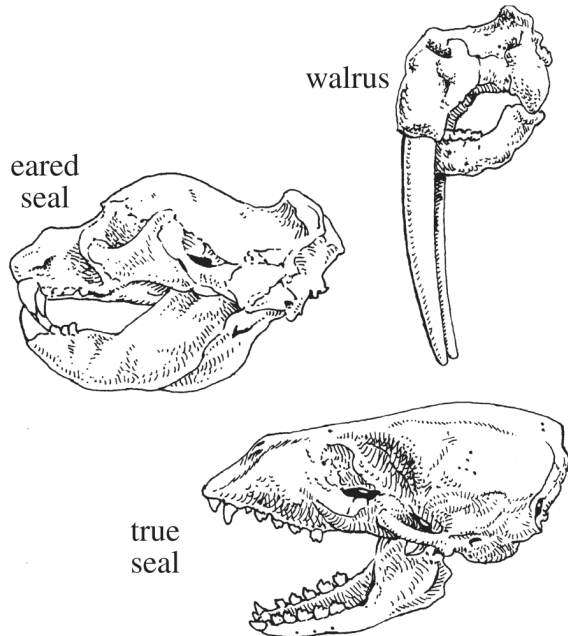


Dolphin Flipper

The similarity in structure of the bones of these animals suggests that

- A. the size of these bones is the same.
- B. these species share common ancestors.
- C. these species developed at the same time and location.
- D. the chemical make-up of these animals is exactly the same.

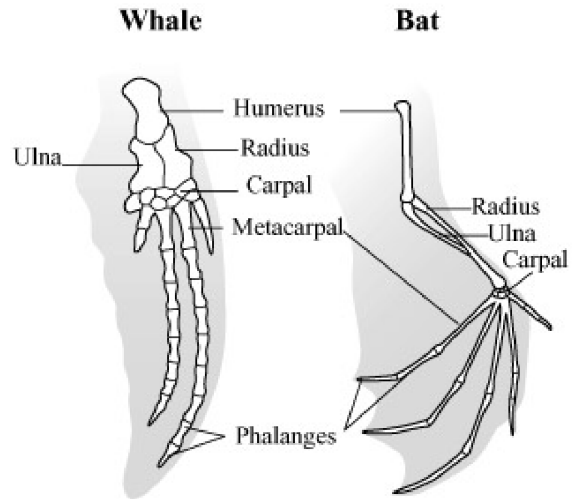
15. The drawings below show skulls of three modern animals.



The three skulls all share characteristics with a fossil skull of an extinct seal (not shown) that is believed to be 23 million years old. What conclusion can be drawn about the relationship between the three modern animals and the fossil?

- A. They are all the same species.
- B. They share a common ancestor.
- C. They share the same food supply.
- D. They are all 23 million years old.

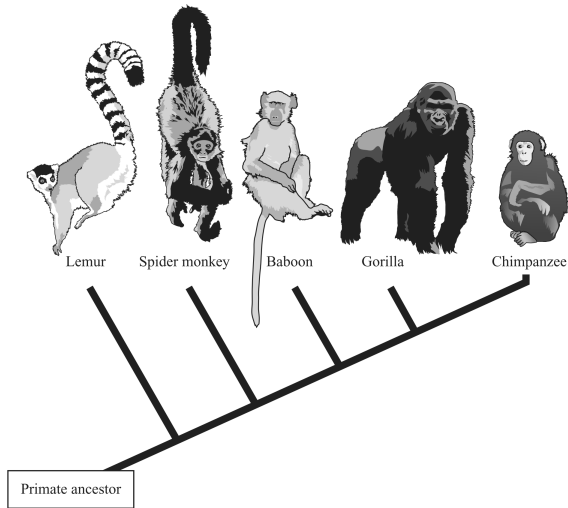
16. The bones of a whale flipper are similar to the bones of a bat wing as shown in the illustration below.



What does this similarity in bone structure suggest about the whale and the bat?

- A. They use the same methods to travel.
- B. They evolved from a common ancestor.
- C. They can migrate to the same locations.
- D. They can manipulate objects in the same way.

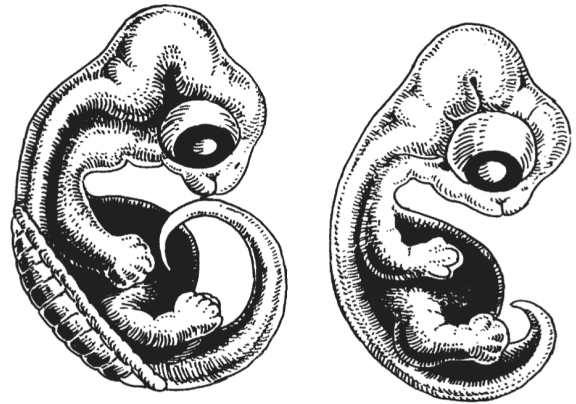
17. The diagram below shows the evolutionary relationship of several primates.



Based on the diagram, which of the following statements is true?

- A. Lemurs were the most recent to evolve.
- B. Gorillas evolved directly from chimpanzees.
- C. Spider monkeys and lemurs evolved at the same time.
- D. Gorillas and baboons evolved from a common ancestor.

18. The drawings below show a turtle embryo and a chicken embryo.



Turtle

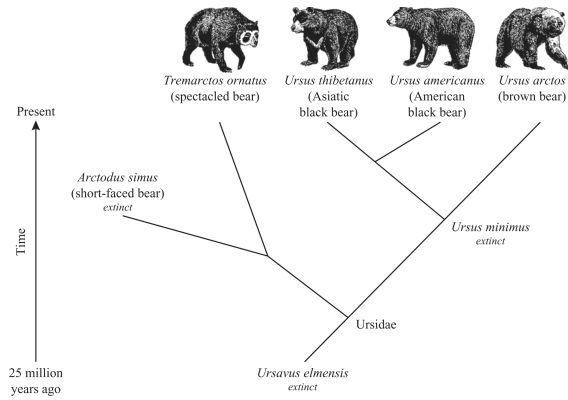
Chicken

Which of the following statements is supported by the similarities between these embryos?

- A. The turtle is more advanced than the chicken.
  - B. The chicken has more offspring than the turtle.
  - C. The turtle and the chicken are similar as adults.
  - D. The chicken and the turtle share a common ancestor.
19. More than 1.5 million species of animals have been described, yet all of them have DNA that is made of the same building blocks. This is evidence that all animals have
- A. a common ancestor.
  - B. identical fossils.
  - C. similar appearances.
  - D. the exact same DNA sequences.



20. A student researching bears found the chart below in a textbook. The chart shows the



Which of the following conclusions is *best* supported by the data given in this chart?

- Modern bears evolved from species that are now extinct.
- The short-faced bear was the ancestor of the Asiatic black bear.
- Present day bear species are more closely related than their ancestors were.
- Natural selection favored the brown bear over the American black bear.

21. Similar structures are present in the embryos of fish, chickens, and rabbits. In fish, these structures develop into gills, but in chickens and rabbits, they either disappear or develop into other body parts later in embryonic development.

Which of the statements below *best* explains the presence of these structures in the embryos of all three species?

- The embryos of the three species are similar in size.
- Breathing structures are similar among the young of the three species.
- The three species have a common ancestor with these embryonic structures.
- The reproductive mechanisms are similar among the adults of the three species.

22. Which of the following provides the *most conclusive* evidence that organisms of two different species share a common ancestor?

- They live in the same ecosystem.
- They reproduce at the same time.
- They have similar DNA sequences.
- They have similar body movements.

23. Frogs, lizards, and birds all have a similar arrangement of bones in their limbs. Which of the following does this similarity *most likely* indicate about these animals?

- A. They move in the same way.
- B. They have a common ancestry.
- C. They evolved at the same time.
- D. They are comparable in size as adults.

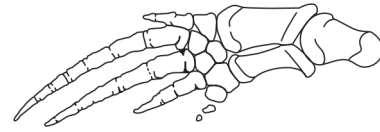
24. Some scientists use molecular evidence to study evolution. One type of molecular evidence is the amino acid sequence of particular proteins in various species.

Which of the following *best* describes what the study of these sequences reveals about the species?

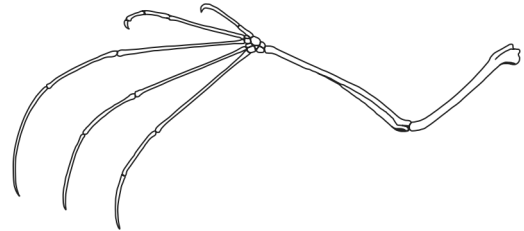
- A. The more similar the sequences are, the faster the species will coevolve.
- B. The more similar the sequences are, the more closely related the species are.
- C. The longer the sequences are, the earlier the species evolved in geologic history.
- D. The longer the sequences are, the more adapted the species are to their environments.

25. The bone structures of a porpoise flipper and a bat wing are shown below.

**Porpoise Flipper**



**Bat Wing**



Which of the following conclusions is *best* supported by the structure of each limb?

- A. The porpoise and bat share a common ancestor.
- B. The porpoise and bat limbs are adapted primarily for grasping.
- C. The porpoise and bat evolved relatively recently in geologic history.
- D. The porpoise and bat limbs are designed to support the entire weight of the animal.

26. Scientists believe that three species of lizards living on the Canary Islands descended from a common ancestor. Similarities in which of the following would *most strongly* support the scientists' theory?

- A. body size
- B. main diet
- C. population sizes
- D. amino acid sequences

27. In humans, the appendix is small and is not needed for digestion. In rabbits, the appendix is well developed and is used in the digestion of plant fibers.

Which of the following provides the *best* scientific explanation for the presence of the appendix in both humans and rabbits?

- A. Rabbits and humans live in environments with similar conditions.
- B. Rabbits and humans are both eukaryotes with similar cell structures.
- C. The appendix is evolving into a new type of organ in rabbits and humans.
- D. The appendix is inherited from a common ancestor of rabbits and humans.

28. A researcher is comparing amino acid sequences for the protein hemoglobin from several primate species. What does the degree of similarity in sequences among the primate species indicate about these species?

- A. how closely related they are
- B. how frequently they interbreed
- C. how rapidly they can evolve in the future
- D. how efficient their circulatory systems are

29. Scientists recovered the body of a woolly mammoth from the frozen soil of Siberia. The DNA sequence of the woolly mammoth was very similar to the DNA sequence of the African elephant.

Which of the following conclusions is *best* supported by this information?

- A. African elephants evolved directly from woolly mammoths.
- B. The woolly mammoth and the African elephant have a common ancestor.
- C. Woolly mammoths had the same number of chromosomes as African elephants.
- D. The woolly mammoth and the African elephant should be classified as the same species.

30. Scientists have concluded that snakes evolved from an ancestor with legs. Which of the following statements provides the *best* evidence for this conclusion?

- A. Most species of snakes live on land.
- B. Snakes move extremely fast to catch their prey.
- C. Snakes have a well-developed backbone and muscular system.
- D. Some species of snakes have limb buds during their embryonic development.

31. The bones that make up the forelimbs of monkeys, cats, whales, and birds are similar. Which of the following statements *best* supports the evolutionary relationship of these animals?

- A. The animals have different ancestries but have adapted to similar environments.
- B. The animals share a common ancestry but have adapted to different environments.
- C. The animals at one time lived in different environments but now share an environment.
- D. The animals use their forelimbs for identical activities but live in different environments.

32. Scientific evidence shows that modern dogs, wolves, and foxes all have a common ancestor. Further evidence shows that dogs are more closely related to wolves than to foxes.

Which of the following observations provides the *best* evidence that dogs are more closely related to wolves than to foxes?

- A. The diets of dogs and wolves are more similar than the diets of dogs and foxes.
- B. The lifespans of dogs and wolves are more similar than the lifespans of dogs and foxes.
- C. The genetic sequences of dogs and wolves are more similar than the genetic sequences of dogs and foxes.
- D. The body sizes of dogs and wolves are more similar than the body sizes of dogs and foxes.

33. Whale fins and bat wings are anatomically similar. Which of the following does this suggest about the animals?

- A. Whales and bats move in the same way.
- B. Whales and bats have a common ancestry.
- C. Whales and bats have existed for the same amount of time.
- D. Whales and bats were once adapted to the same environment.

34. Which of the following observations *best* supports the conclusion that two animal species evolved from a common ancestor in recent geological history?

- A. The species are both herbivores.
- B. The species have similar bone structure.
- C. The species live in the same environment.
- D. The species both obtain oxygen from the air.

35. Which of the following observations *best* supports the conclusion that dolphins and sharks do not have a recent common ancestor?
- A. Dolphins form social groups, but sharks are solitary.
  - B. Dolphins hunt during the day, but sharks are nocturnal.
  - C. The number of dolphin species is far less than the number of shark species.
  - D. The jawbone structure in dolphins is very different from the jawbone structure in sharks.

36. Which of the following provides the *most convincing* evidence that two different animal species evolved from a common ancestor?

- A. They live in similar environments.
- B. They have similar adult body shapes.
- C. They have similar methods of locomotion.
- D. They show similar features in embryonic development.

37. A scientist is examining a fossilized insect that may be an ancestor of modern dragonflies. Which of the following should the scientist compare to *best* determine how closely related the fossilized insect is to modern dragonflies?

- A. their diets
- B. their habitats
- C. their predators
- D. their anatomies

38. Fossils of snakes with hind limbs but no forelimbs have been discovered. Which of the following conclusions is *best* supported by this fossil evidence?

- A. Snakes are likely to evolve limbs in the future.
- B. Snakes are well adapted to live on land without limbs.
- C. Snakes have evolved from an ancestral reptile with limbs.
- D. Snakes are poor competitors compared to reptiles with limbs.

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

A scientist is studying a group of related flowering plants. She set up a series of experiments to study relatedness, classification, and patterns of inheritance within this group of plants.

To study the relatedness among plants, the scientist compared a specific RNA sequence in four different species of plants. The results are shown in the table below.

**PERCENT SIMILARITY OF A SPECIFIC RNA SEQUENCE**

		Plant Species			
		1	2	3	4
Plant Species	1	—	88	92	85
	2	88	—	93	95
	3	92	93	—	87
	4	85	95	87	—

Which two species are *most closely* related?

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

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

Mammals, birds, modern reptiles, and theropod dinosaurs are vertebrates. The table below shows some of the differences and similarities among these groups of vertebrates.

**CHARACTERISTICS OF VERTEBRATE GROUPS**

	Mammals	Birds	Modern Reptiles	Theropod Dinosaurs
Number of ear bones	3	1	1	1
Legs directly under body	yes	yes	no	yes
Produce milk	yes	no	no	no
Constant body temperature	yes	yes	no	yes
Live birth	yes	no	some	no
Skin covering	hair	feathers/scales	scales	feathers/scales

According to the table, which of these vertebrates are *most closely* related?

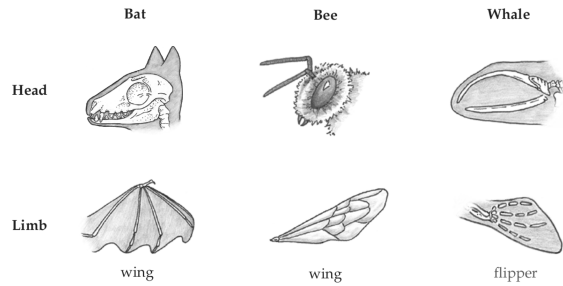
- A. mammals and modern reptiles  
 B. theropod dinosaurs and modern reptiles  
 C. mammals and theropod dinosaurs  
 D. birds and theropod dinosaurs

41. Scientists have found many similarities in the proteins of turtles and sharks.

These similarities suggest that turtles and sharks

- A. have stopped evolving  
 B. have a common ancestor  
 C. have all the same DNA sequences  
 D. have the same number of chromosomes

42. Students used the three organisms shown below to study evolutionary relationships.

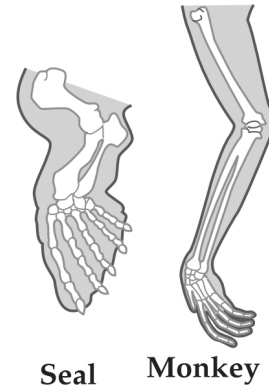


Which of these structures are the *best* evidence of an evolutionary relationship?

- A. bat wing and bee wing
- B. bat lower jaw and whale lower jaw
- C. whale flipper and bee wing
- D. bat wing and whale flipper

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

The figure below shows the skeletal structure of a seal's flipper and a monkey's arm.



The skeletal structures of the flipper and the arm are similar, even though they have different functions. Seals use their flippers for swimming, while monkeys use their arms primarily for grasping and lifting.

Which of these explains why the skeletal structures of the seal's flipper and the monkey's arm are similar?

- A. Seals and monkeys have a common ancestor.
- B. Seals and monkeys have identical DNA sequences.
- C. All of the same genetic mutations occurred in seals and monkeys.
- D. All of the same vitamins are used for bone formation in seals and monkeys.

44. A researcher is studying raccoons and skunks. She wants to find out how closely these two mammals are related. Which of these characteristics would be *best* for her to study?

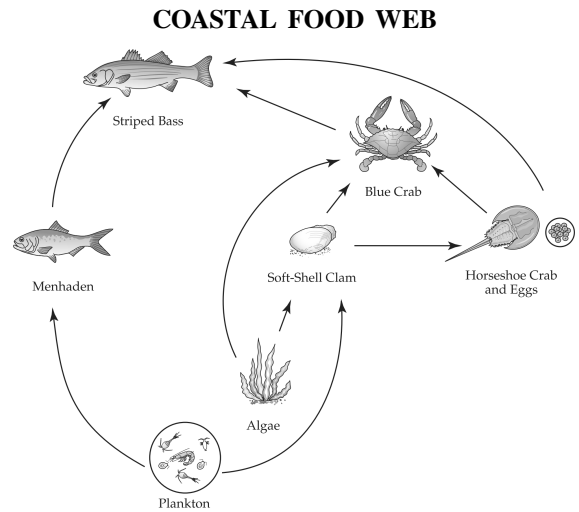
- A. sequences of DNA
- B. reproductive habits
- C. movement of RNA
- D. physical appearance

45. A 125-million-year-old small mammal skeleton was recently discovered in China. The role of this small mammal in its ecosystem can *best* be determined by comparing its skeleton to

- A. ancient small mammal skeletons
- B. modern small mammal skeletons
- C. modern small mammal DNA
- D. ancient small mammal DNA

46. Use the information and the food web below to answer the following question(s).

Shallow coastal waters provide an essential habitat to a variety of plants and animals. A small part of a coastal food web is shown below.



Which of these characteristics would provide the *best* evidence to determine if menhaden and striped bass are closely related?

- A. They are both cold-blooded.
- B. They occupy the same trophic level.
- C. They both live in coastal waters.
- D. They have similar DNA sequences.



47. Use the following data table to answer the following question.

<b>Organism</b>	<b>Respiration</b>	<b>Reproduction</b>	<b>Circulation</b>	<b>Skeleton</b>
1	Through a moist outer surface	Asexual	Closed	Internal
2	Through gills	Sexual	Closed	Internal
3	Through holes in outer surface	Sexual	Open	External
4	Through lungs	Sexual	Closed	Internal
5	Through an outer surface	Asexual	None	None

According to the data table, which two organisms are *most* closely related?

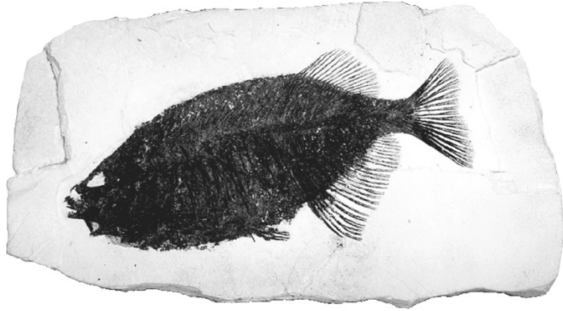
A. 1 and 2

B. 1 and 5

C. 2 and 4

D. 4 and 5

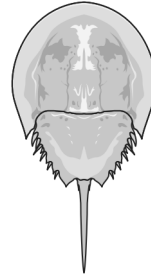
48. The picture below shows a fossil.



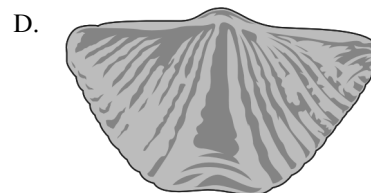
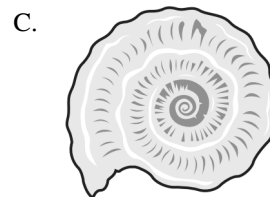
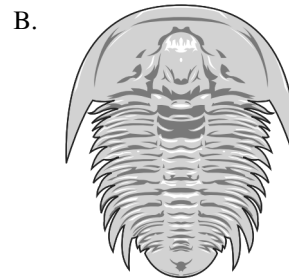
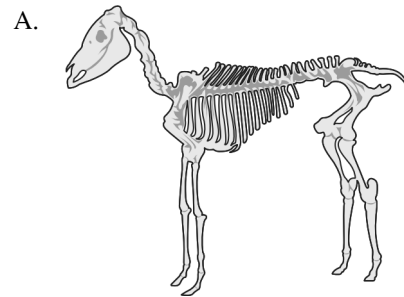
What makes this fossil similar to a fish?

- A. the body and fins
- B. the eyes and length
- C. the bones and size
- D. the color and mouth

49. The picture below shows a horseshoe crab.



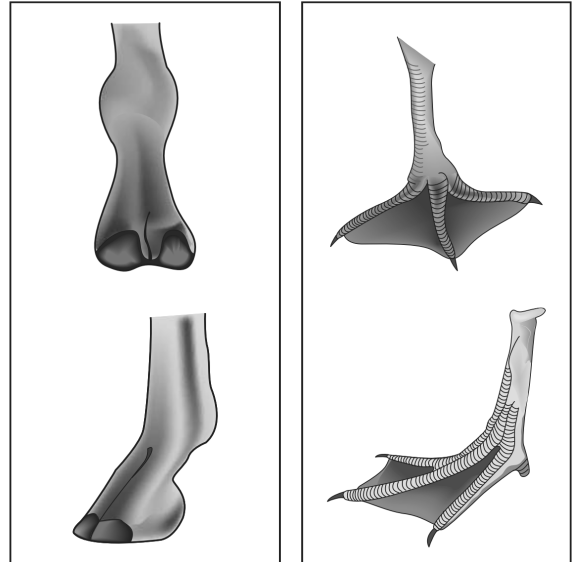
Today's horseshoe crabs are related to trilobites. Trilobites lived more than 251 million years ago and are extinct. Which organism is *most likely* a trilobite?



50. According to scientists, donkeys and horses share a common ancestor. Which evidence shows that the two organisms are related?

- A. Both are tall.
- B. Both run fast.
- C. They have the same diet.
- D. They have the same bones in their limbs.

51. The following images show the hoof of a mountain goat and the webbed foot of a duck.



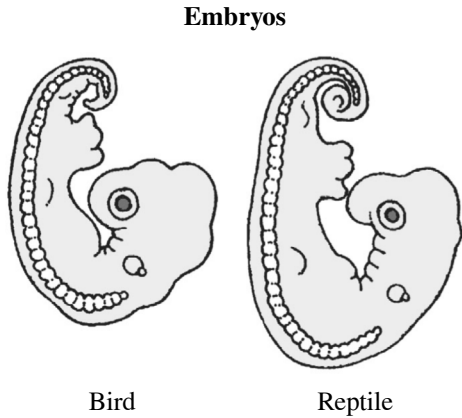
Mountain Goat's Hoof

Duck's Webbed Foot

Which statement describes the reason for the difference in form between the two organisms?

- A. These two organisms raise offspring differently from each other.
- B. These two organisms have to find different types of food to survive.
- C. These two organisms compete against each other for the same habitat.
- D. These two organisms are adapted to be able to move in different environments.

52. The diagram illustrates an embryonic stage of two organisms.



Which of the following can be determined by observing the embryos shown in the diagrams?

- A. The organisms share a common ancestry.
- B. The organisms belong to the same genus.
- C. The organisms are native to the same geographic areas.
- D. The organisms will grow into anatomically similar adults.

53. The diagram below depicts the DNA fingerprints of four fish species.

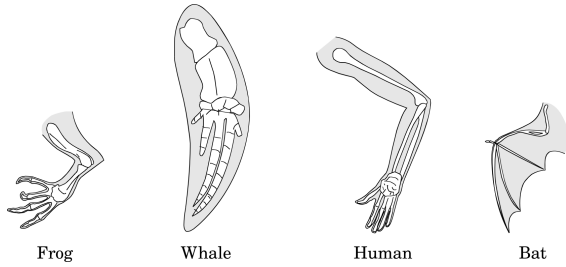
Species 1	Species 2	Species 3	Species 4
██████████	██████████	██████████	██████████
	██████████	██████████	
██████████		██████████	██████████
██████████		██████████	██████████
██████████		██████████	██████████
	██████████	██████████	
██████████		██████████	██████████
██████████		██████████	

Which two species of fish are most closely related?

- A. 1 and 4
  - B. 1 and 2
  - C. 2 and 3
  - D. 3 and 4
54. A paleontologist is comparing the fossilized remains of two primates. Both animals had a prehensile tail. What can be concluded from this evidence?

- A. They were not related.
- B. They lived on the ground.
- C. They evolved from a common ancestor.
- D. They had bipedal locomotion.

55. This diagram represents the bone structures of the front limbs of four different animals.



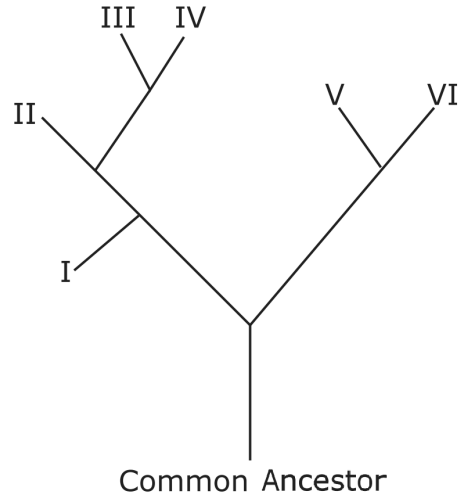
What do the similarities of the structures suggest about these organisms?

- A. They grow at the same rate.
- B. They live in the same environment.
- C. They live for the same length of time.
- D. They evolved from a common ancestor.

56. Scientists think that dolphins and whales may have evolved from a common ancestor. What evidence supports this hypothesis?

- A. They swim the same way.
- B. They eat the same food.
- C. They live in the same area of the ocean.
- D. They have similar anatomies.

57. This diagram shows a cladogram of six species based on amino acid similarities.



Which two species are the *most closely* related?

- A. I and II
- B. II and IV
- C. I and V
- D. V and VI

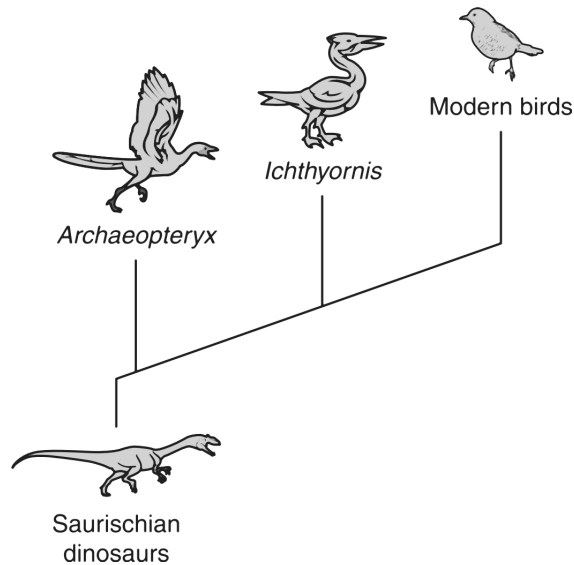
58. Which characteristic would provide the *best* evidence that species of living crabs and lobsters are related to extinct trilobite species?

- A. similar body structures
- B. similar habitats
- C. similar body size

59. If related organisms are found to have some of the same enzymes and hormones, which *most likely* can be concluded?

- A. These organisms may eat the same foods.
- B. These organisms may live in similar environments.
- C. These organisms may share a common ancestor.

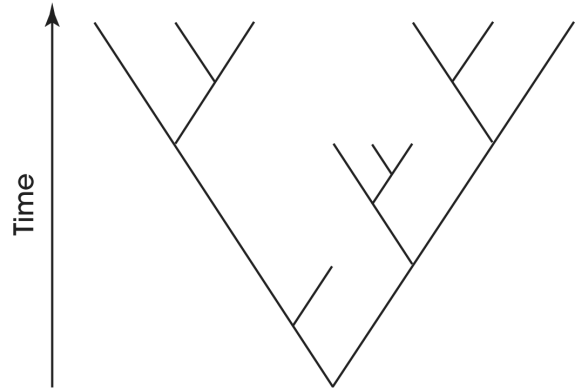
60. The diagram below shows one example of an evolutionary line for birds.



Which conclusion does the information in the diagram *best* support?

- A. *Ichthyornis* is still living today.
- B. All of these organisms evolved at the same time.
- C. Most bird fossils found today are Saurischian dinosaurs.
- D. *Archaeopteryx* and modern birds have a common ancestor.

61. The following diagram is found in an evolutionary biology textbook.



This branching tree diagram is most likely used to represent the theory that suggests

- A. new species arise throughout time following rounds of mass extinction.
- B. all species share a common ancestor and that change occurs through time.
- C. speciation occurs very quickly with long periods of no change in between.
- D. all species originated during the same period and some have subsequently gone extinct.

62.

Comparisons of Homologous and Analogous Structures

Homologous Structures	Analogous Structures
<ul style="list-style-type: none"><li>• look very different and often have different functions but evolved from a common ancestor</li><li>• example: Bird wings and human arms have a humerus, radius, and ulna.</li></ul>	<ul style="list-style-type: none"><li>• perform similar functions but evolved from different ancestors</li><li>• example: Insects and birds both fly with wings.</li></ul>

Which statement correctly interprets the importance of structures in biological classification systems?

- A. Animals with homologous structures are closely related genetically.
- B. Animals with analogous structures are closely related genetically.
- C. Animals with homologous structures develop analogous structures.
- D. Animals with analogous structures develop homologous structures.

63. Several species of extinct giant tortoise lived on different islands in the Indian Ocean. One species is still alive on Aldabra Island. The shells and skins of the extinct tortoises are in museums and can be studied. What is the most accurate way to find out how closely related the living one is to the extinct ones?

- A. Search the history records of what the extinct turtles looked like.
- B. Compare the bones and shells of the extinct tortoises to each other.
- C. Measure the distance between Aldabra and the islands on which each species lived.
- D. Compare the DNA sequence of all the tortoise species, extinct and living.

64. Which of these characteristics is found in birds, reptiles and mammals?

- A. They all have warm body temperatures.
- B. They all lay eggs to reproduce.
- C. They all have internal skeletons.
- D. They all eat other animals for food.

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



41.  
Answer: B

42.  
Answer: D

43.  
Answer: A

44.  
Answer: A

45.  
Answer: B

46.  
Answer: D

47.  
Answer: C

48.  
Answer: A

49.  
Answer: B

50.  
Answer: D

51.  
Answer: D

52.  
Answer: A

53.  
Answer: A

54.  
Answer: C  
Objective: B.07A

55.  
Answer: D  
Objective: B.07A

56.  
Answer: D

57.  
Answer: D

58.  
Answer: A

59.  
Answer: C

60.  
Answer: D

61.  
Answer: B

62.  
Answer: A

63.  
Answer: D

64.  
Answer: