

APOLLO

Evolution and speciation

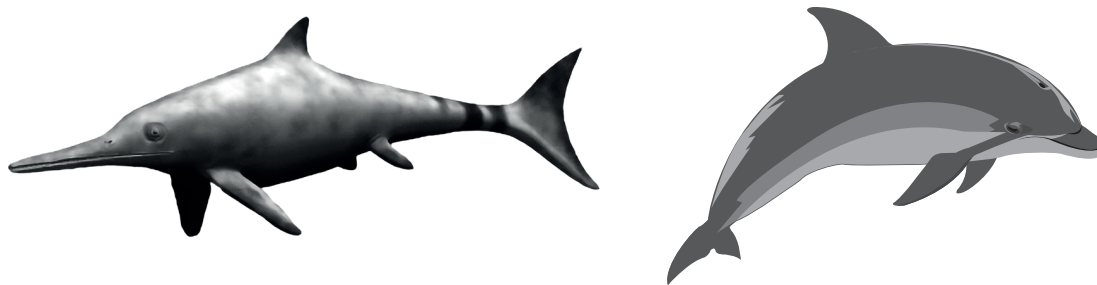
SL

Biology

First assessment 2025

10 questions | questions

- 22.** The images show an ichthyosaurus and a dolphin. Ichthyosaurus is an extinct aquatic reptile, known only from fossil remains. Dolphins are mammals.



How have these species evolved?

- A. Their streamlined bodies show divergent evolution.
- B. Their streamlined bodies are analogous structures.
- C. Their pentadactyl limbs are an example of convergent evolution.
- D. Their pentadactyl limbs are analogous structures.

Turn over

22. What describes analogous structures?

- A. They are formed from divergent evolution.
- B. They share a common ancestor.
- C. They came from different evolutionary origins.
- D. They have the same structure but different functions.

Turn over

14. The salamander genus *Ensatina* from California, USA, has evolved several different forms, depending on location. Two such forms are shown.

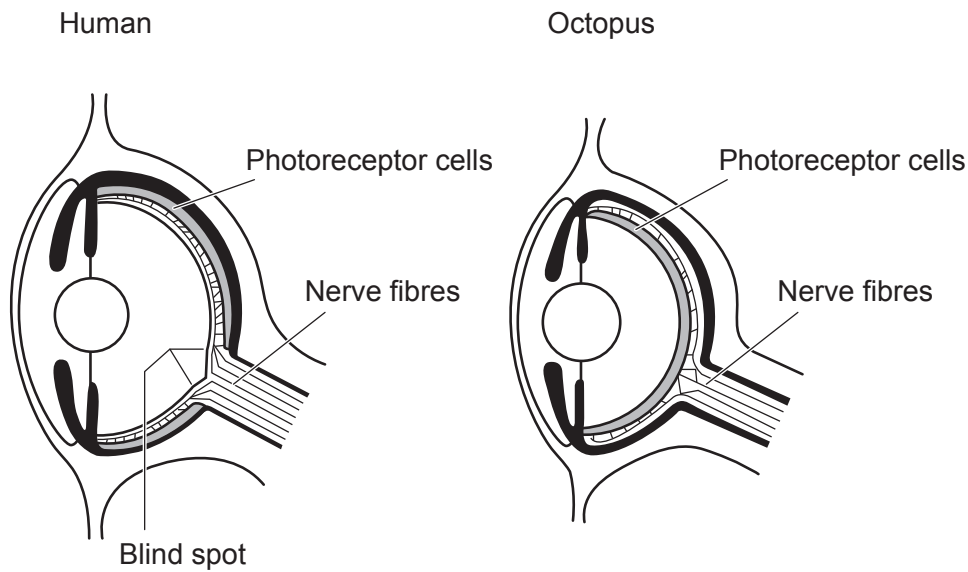


What determines if these forms are members of the same species?

- A. Have similar appearance
- B. Populations mix freely
- C. Produce fertile offspring
- D. Can interbreed

Turn over

23. Human and octopus eyes have a similar structure and function but humans and octopuses have a different evolutionary origin.



What explains the similar structure of these eyes?

	Type of evolution	Relationship of structures
A.	convergent	analogous
B.	convergent	homologous
C.	divergent	homologous
D.	divergent	analogous

Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

3. (a) Describe the role of the EDGE of Existence programme.

[2]

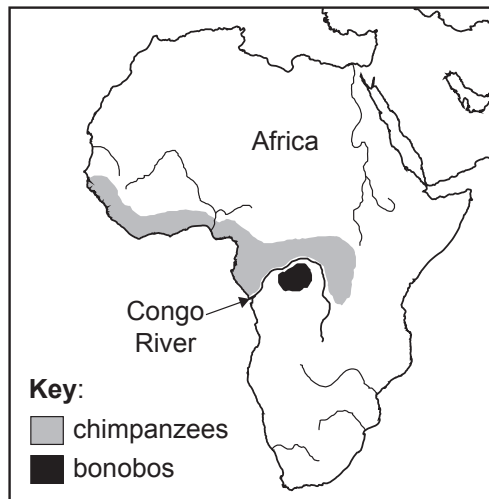
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Chimpanzees and bonobos are different species of primate. It is thought that neither species can swim. The map shows the relative locations of chimpanzees and bonobos in Africa.



Evidence suggests that the level of the Congo River was lower during one period in the past. At this time, chimpanzees could have migrated across.

- (b) Explain how bonobos could have evolved from chimpanzees by speciation.

[3]

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Turn over

22. Bonobos (*Pan paniscus*) and chimpanzees (*Pan troglodytes*) are primates.



Bonobo (*Pan paniscus*)



Chimpanzee (*Pan troglodytes*)

Separation by the Congo River allowed these two species to be formed. What was a consequence of the separation?

- A. Natural selection
- B. Reproductive isolation
- C. Selective breeding
- D. Analogous structures

24. What is evidence for evolution?

- I. Homologous structures such as pentadactyl limbs
 - II. Domestication of dogs from wolves
 - III. Inheritance of acquired characteristics
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- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

13. According to the biological species concept, which of the following indicates that two organisms belong to the same species?

- I. They occupy the same ecological niche.
- II. They share morphological features.
- III. They can crossbreed and produce fertile offspring.

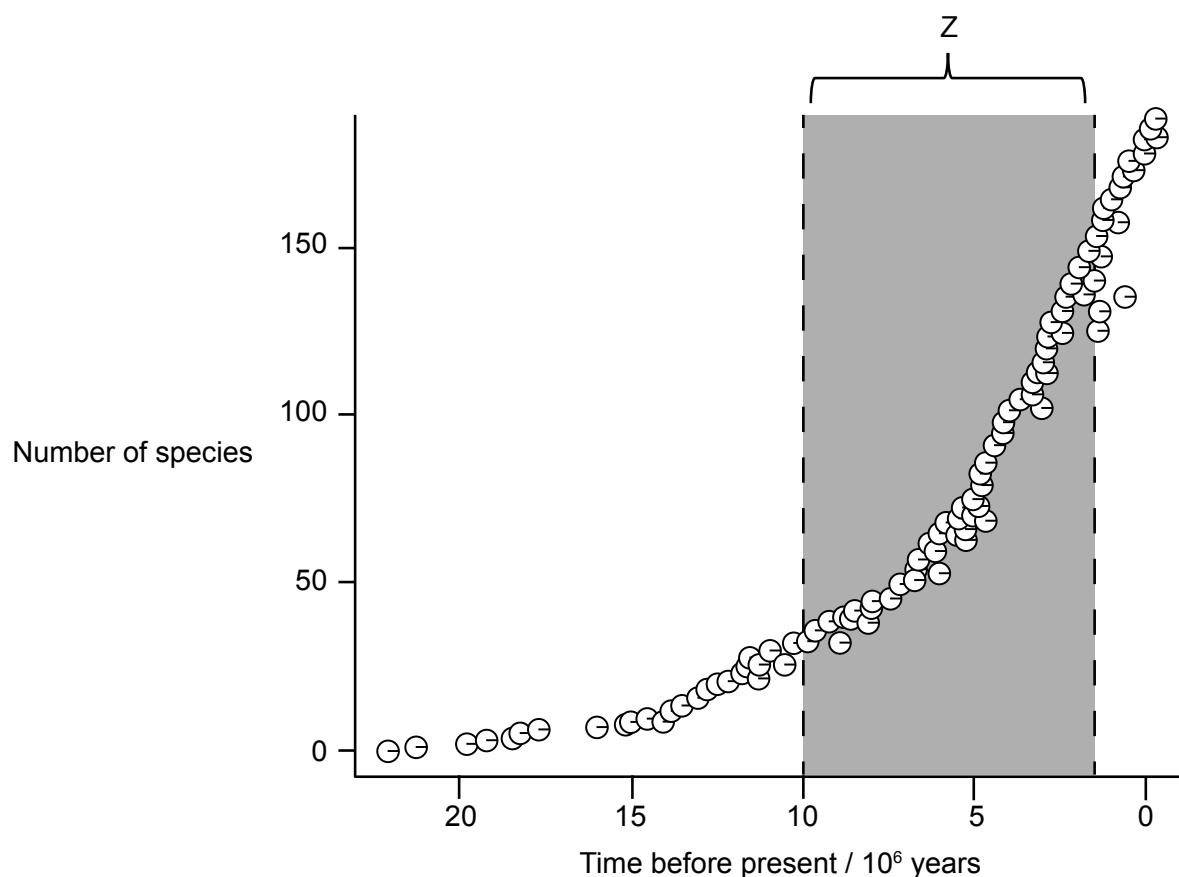
- A. I only
- B. I and II
- C. II and III
- D. III only

23. What can lead to the emergence of analogous structures?

- A. Divergent evolution from a recent common ancestor
- B. Convergent evolution of unrelated species
- C. Splits in the fundamental niche of a species
- D. Splits in the realized niche of a species

Turn over

24. The number of hummingbird species in South America has increased continuously as shown in the graph.



What could be a reason for the increase in the number of hummingbird species during the period labelled Z?

- A. Food and shelter are plentiful and there is little intraspecific competition.
- B. Closely related species can coexist indefinitely in the same niche.
- C. A wide range of unoccupied potential niches exists, leading to adaptive radiation.
- D. There are few limiting factors on the population size of hummingbirds.