



## EXAM PAPERS PRACTICE

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Level: HL IB in Biology  
Subject: Biology  
Topic: IB HL Biology  
Type: Topic Question

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All International Baccalaureate IB Topic Questions HL Biology

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**BIOLOGY**

**HL - IB**

Key skills

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**\*\*Question 1\*\***

What is the most important requirement for speciation to occur?

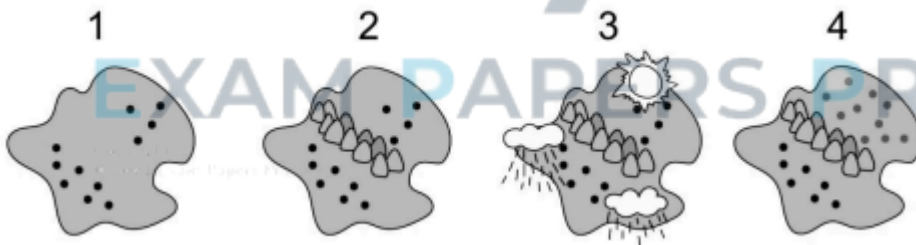
- A. A geographical barrier is needed to separate different species from one another so that natural selection can occur
- B. Mutations occurring within a population which brings about slight changes to the phenotype of individuals
- C. Reproductive isolation must occur within a population which can be brought about by a range of different barriers
- D. Organisms must be able to find a suitable mate within their habitat in order to pass on their genetic information

[1 mark]

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**\*\*Question 2\*\***

Which of the following would be the best description of the events depicted in the diagram?



- A. A geographical barrier separated two populations of the same species, and over time they adapted to new conditions in their environment
- B. A temporal barrier meant that the two populations were not able to reproduce during the same season anymore and formed new species
- C. A geographical barrier separated two populations of different species, and over time they adapted to seasonal differences in their habitat
- D. A temporal barrier separated two populations, which led to behavioral changes that resulted in speciation

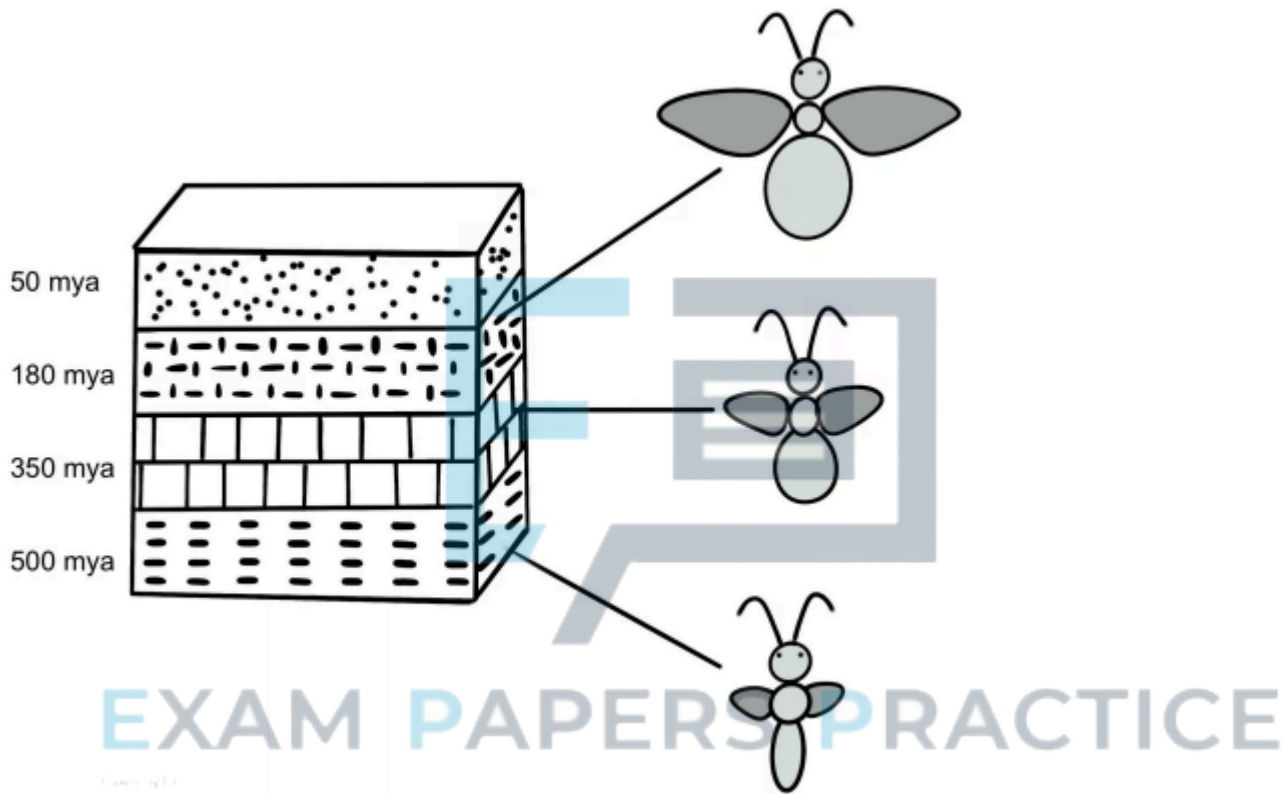
[1 mark]

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**\*\*Question 3\*\***

A team of paleontologists discovered the remains of an insect-like organism trapped in amber, which was found in rock layers believed to be about 180 million years old. As they dug deeper into older rock layers, they made several further discoveries. Their findings are shown in the diagram below.



What conclusion can be drawn from the information given?

- A. The changes observed in these populations occurred gradually from 180 million years ago until 500 million years ago
- B. The original population changed dramatically over time, leading to the formation of several different species
- C. There were several large speciation events that occurred within a short period of time in these populations
- D. Evolutionary change occurred gradually, with many small changes accumulating over a long period of time

[1 mark]

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**\*\*Question 4\*\***

Why can polyploidy be considered an advantage to some plant species?

- A. Meiosis can occur more rapidly, leading to an increased rate of gamete formation
- B. It increases the diversity of alleles within a population and reduces the impact of recessive mutations
- C. The polyploid plant can reproduce more successfully with diploid plants from the same species
- D. It can lead to the occurrence of more purebred individuals within a plant population

[1 mark]

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**\*\*Question 5\*\***

Why do species evolve over time?

- A. To become better adapted to their environment
- B. Because of changes in the bodies of organisms
- C. Because of changes in the heritable characteristics of organisms
- D. Because certain characteristics are advantageous

[1 mark]

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**\*\*Question 6\*\***

Which of the following must occur for speciation to take place?

- I. Two populations of a species must be separated by a mountain range or body of water.
- II. No gene exchange can take place between two populations of a species.
- III. Two populations must develop differences in their physical characteristics.

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

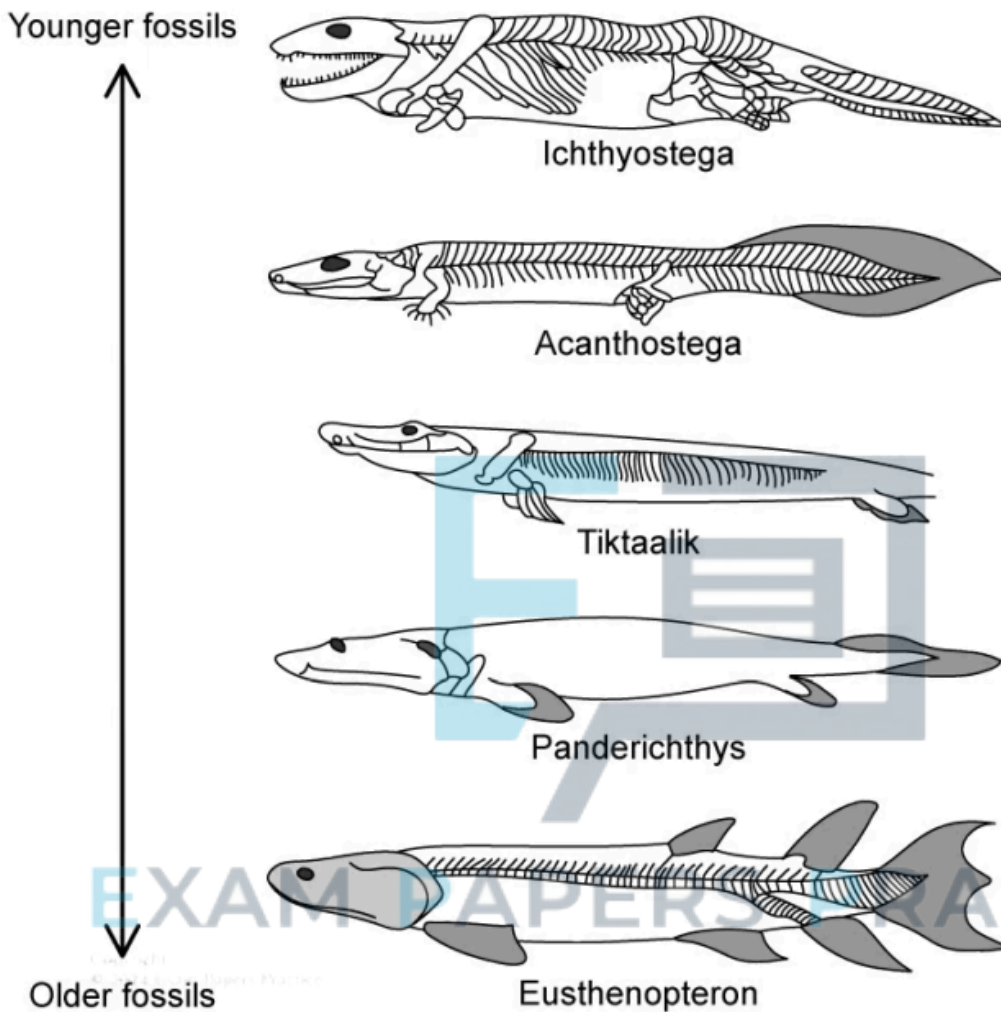
[1 mark]

**\*\*Question 7\*\***

The image below shows a series of fossils.

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How does this set of fossils provide evidence for evolution?

- A. They show the complete transition between fish and four-legged land animals
- B. They show that species change to become better adapted to their environment
- C. They strengthen the evidence for species change over time provided by the rest of the fossil record
- D. They show that limbs are always advantageous over fins

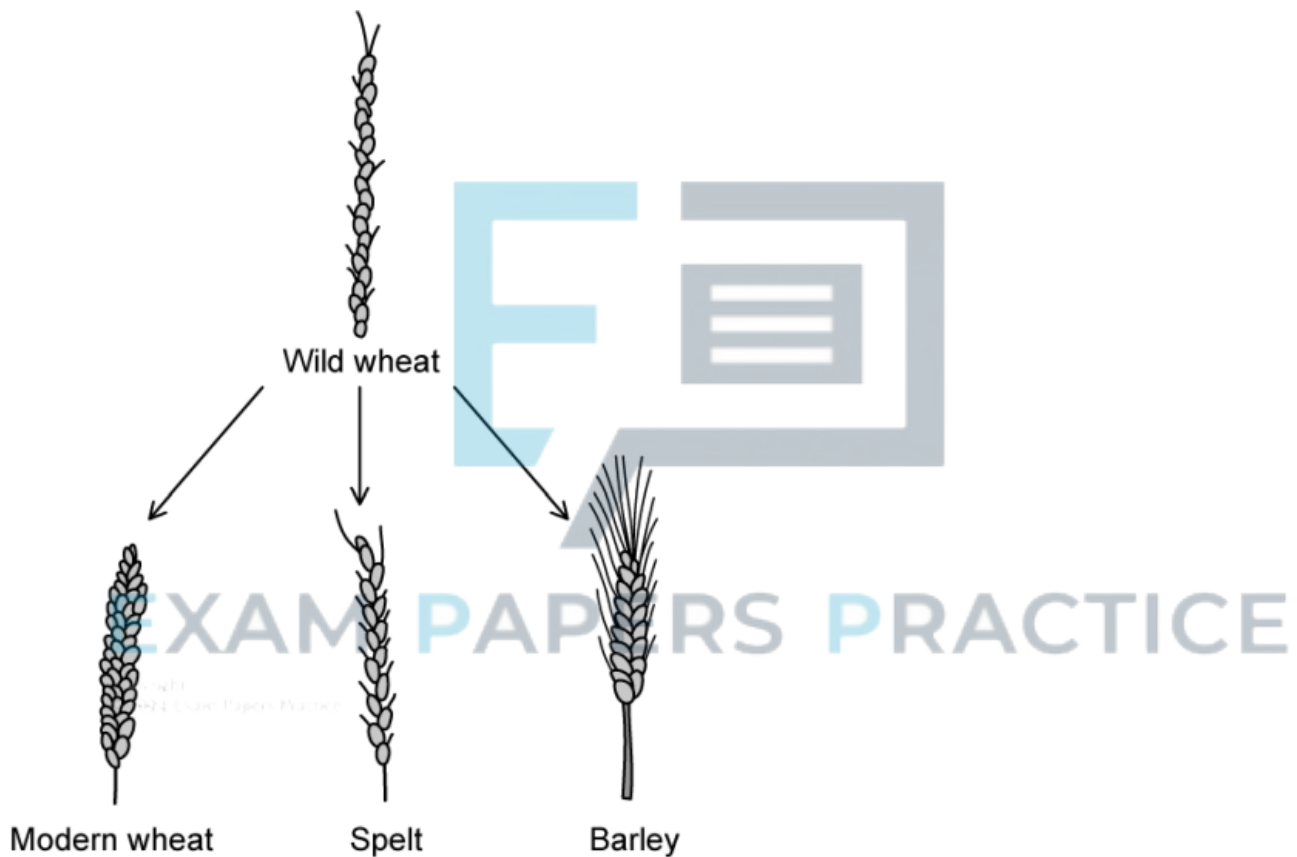
[1 mark]

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**\*\*Question 8\*\***

The diagram below shows how selective breeding has developed several modern crop varieties from wild wheat.

The selective breeding of modern wheat from wild wheat would begin with the breeders selecting individuals with many large seeds.



What is the correct continuation of the process for the selective breeding of modern wheat from wild wheat?



	Stage 1	Stage 2	Stage 3
A	Selected individuals are bred together	Offspring which produce many, large seeds are bred together	Stages 1–3 are repeated over many generations
B	Selected individuals are allowed to reproduce asexually	Offspring are allowed to mature	Stages 1–3 are repeated over many generations

C	The genes for these desirable characteristics are isolated	These desirable genes are inserted into wheat gametes	Fertilisation takes place and the plants are allowed to mature
D	Selected individuals are bred together	Offspring which produce many, large seeds are bred together	Stages 1–3 are repeated once more

[1 mark]

**\*\*Question 9\*\***

Melanin is a dark pigment produced in the cells; higher melanin production results in an organism's darker color. It has been noted that melanistic peppered moths have become more common than non-melanistic individuals in industrialized parts of the UK, where air pollution has increased.

Air pollution kills organisms called lichens that grow on the bark of trees. Areas with clean air have more lichen, resulting in trees of a lighter color compared to polluted areas where lichen are killed, causing tree trunks and branches to appear darker.

Which of the following is **not** a reason for the evolution of melanism in peppered moths?

- A. Predators such as birds act as a selection pressure, leading to differences in survival rates of moths with and without melanism
- B. Pollution from industry causes the death of lichens, leading to darkening of tree bark
- C. There is variation in the gene coding for melanin production in the moth population
- D. Some moths acquire darkened wings as a result of soot particles in the air, providing them with camouflage

[1 mark]