

Q1. (June 2018)

4 Which of these processes can produce a **new** allele?

- A A change in the environment
- B Asexual reproduction
- C Mutation
- D Selective breeding

Your answer

[1]

Q2. (June 2018)

13 Which statement **best** describes the development of the theory of evolution by natural selection?

- A Darwin and Mendel working together
- B Darwin and Wallace working independently
- C Darwin and Wallace working together
- D Mendel working on his own

Your answer

[1]

Q3. (June 2019)

14 How does the fossil record provide evidence for evolution?

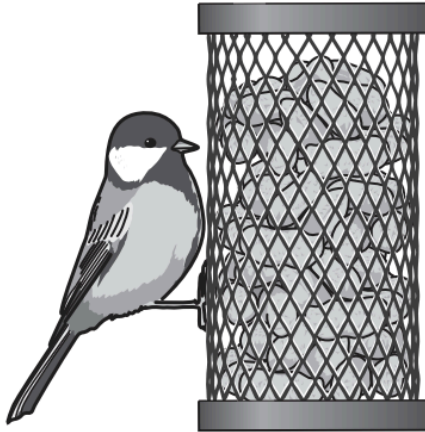
- A It provides information about **all** extinct organisms.
- B It shows that all organisms have evolved at the same rate.
- C It shows that many small changes can result in a large change in organisms over time.
- D It shows that changes in phenotype occurring during life can be passed on in the genes.

Your answer

[1]

Q4. (June 2019)

(a) Many people in the UK feed birds nuts using a bird feeder, as shown in the diagram below.



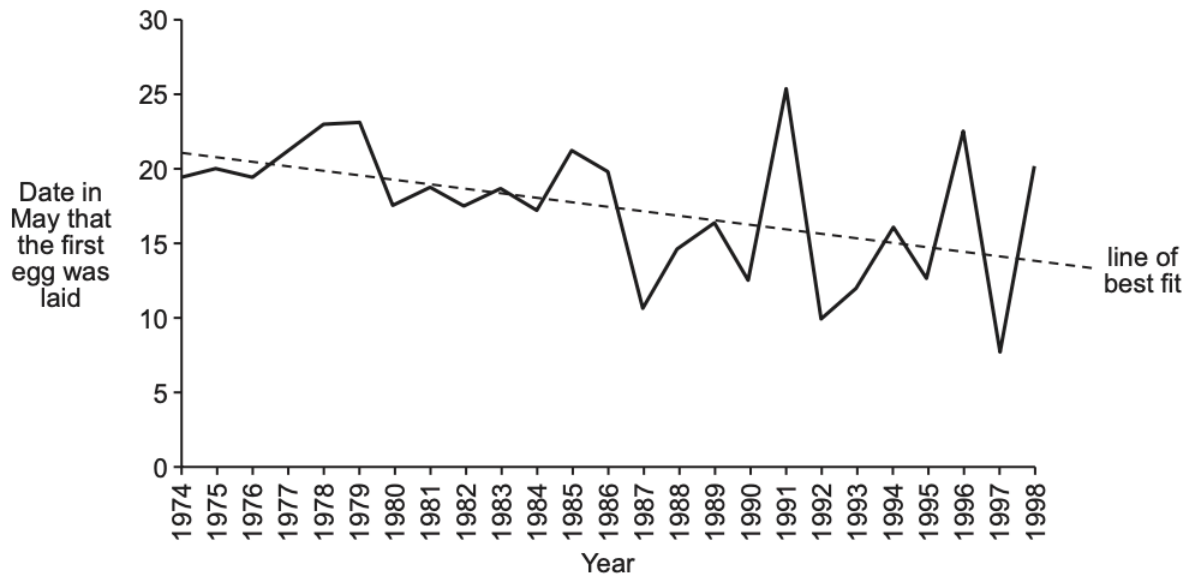
Use Charles Darwin's theory of natural selection to explain why the blue tits in the UK have slightly longer beaks than those in the rest of Europe.

[4]

(b) Blue tits usually lay their eggs in the month of May.

For many years, the scientists have recorded the first day that an egg was laid.

This data is shown in the graph.



The scientists made this explanation for the results:

The results are due to climate change.

Suggest arguments **for** and **against** this possible explanation.

Use information from the graph in your answer.

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Q5. (June 2019)

- 23** Rats are a major pest in many areas of the world. They can reduce food security and spread diseases.



- (a)** Warfarin is a chemical that is used as a rat poison. It stops the correct functioning of platelets in the blood.

Explain why warfarin can be used as a rat poison.

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- (b)** In 1958, some rats were found that were resistant to warfarin. They did not die, even when fed with large amounts of the poison. Scientists found that the resistance was due to dominant allele **R**.

Two resistant rats can mate and produce non-resistant rats.

Draw a genetic diagram below to show how these non-resistant rats can be produced.

- (c) When scientists studied the resistant rats they found that there were two different types.

Homozygous rats are resistant to warfarin but need to eat 20 times more vitamin K.

Heterozygous rats are resistant to warfarin but only need slightly increased amounts of vitamin K.

The scientists found that the non-resistant rats never died out completely.

Explain why.

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- (d) Scientists now think that they might be able to reduce rat populations by using genetic engineering. They want to insert a gene into male rats that destroys all sperm that contain an X chromosome.

- (i) Name the enzyme used to join two sections of DNA together in genetic engineering.

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- (ii) Explain how this method of genetic engineering would rapidly reduce the rat population.

You may use a diagram in your answer.

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3 What is phylogenetics?

- A** Classification using behavioural characteristics
- B** Classification using evolutionary links
- C** Classification using physical characteristics
- D** Classification using species name

Your answer

[1]

Q7. (June 2022)

9 Charles Darwin and Alfred Wallace were both involved in the development of the theory of evolution by natural selection.

How were they involved?

- A** Darwin first suggested the theory and Wallace developed it a hundred years later.
- B** They both travelled together on a ship called the Beagle.
- C** They worked together writing a book called 'On the Origin of Species'.
- D** They wrote scientific papers separately but then presented them together.

Your answer

[1]

Q8. (June 2023)

The diagram shows details of four species **A–D** who were modern humans' close relatives. It shows where fossils were found and dates of when the organisms were alive.



[1]

Q9. (June 2023)

- 21** Sorghum is a crop plant grown in Africa for its seeds.



- (a)** Sorghum produces a bitter chemical in its seeds.

Birds do not like the taste of this chemical. Some people also find the taste unpleasant.

Explain how sorghum could have evolved to produce the bitter chemical.

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- (b)** In some areas in Africa, farmers have been growing varieties of sorghum that have lower levels of the bitter chemical.
These varieties have been produced by artificial selection.

Describe how the process of artificial selection is carried out.

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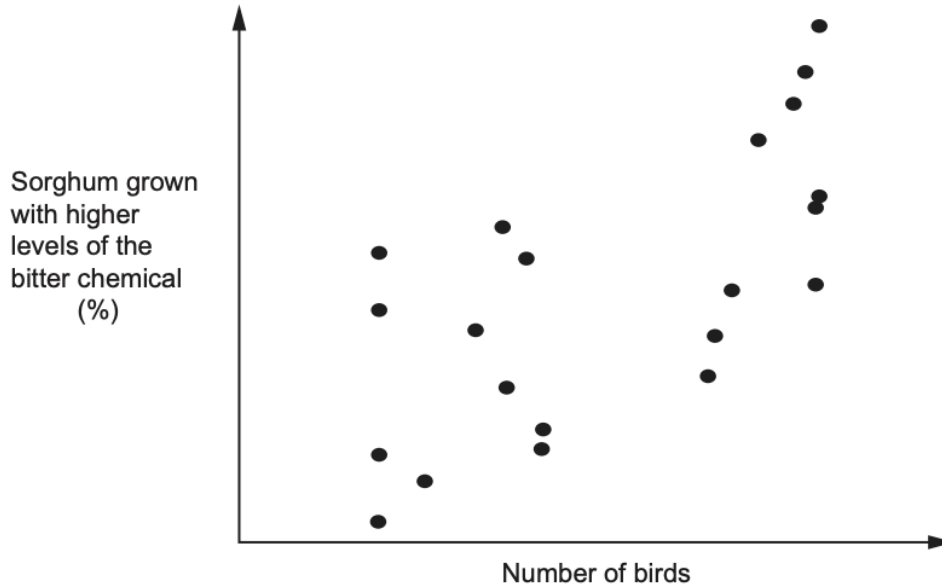
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- (c) Scientists recorded the types of sorghum grown in different areas of Africa that have higher levels of the bitter chemical. They also recorded the number of birds that eat sorghum living in the same areas.

The graph shows their results.



Suggest an explanation for the pattern of results shown in the graph.

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Q10. (June 2024)

2 Which process can make new alleles?

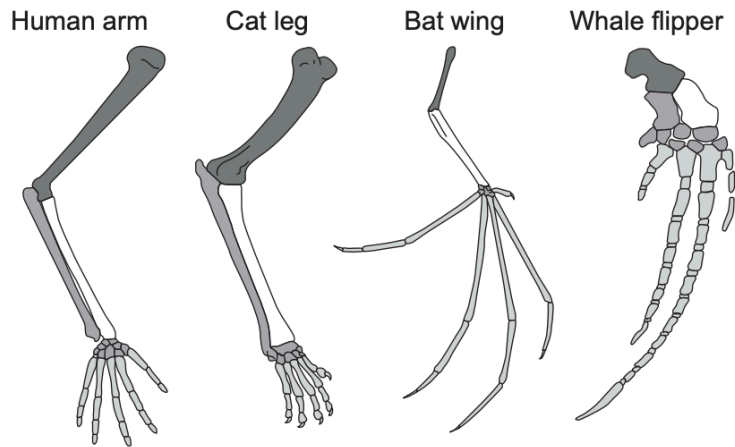
- A Evolution
- B Mutation
- C Selective breeding
- D Specialisation

Your answer

[1]

Q11. (June 2024)

14 Why are the different structures of these limbs evidence for evolution?



- A** Differences in the limb bones show that humans, cats and bats evolved from whales.
- B** Evolution is a random process producing similar structures for different functions.
- C** The limbs have a similar structure as the organisms all shared a common ancestor.
- D** The limbs have all evolved from a common ancestor to perform the same function.

Your answer

[1]

Q12. (June 2024)

Scientists have found that:

- Explain why the number of tuskless elephants is rapidly increasing in East Africa.

[6]

6 Which of these is a **similarity** between selective breeding and natural selection?

- Your answer

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[1]

Q14. (Nov 2020)

- 8 Darwin and Wallace both developed theories of natural selection. Both of their theories were developed after making observations on islands.

What is the most likely explanation for this?

- A Conditions on neighbouring islands are very similar.
- B Different characteristics were observed in organisms on islands compared to the mainland.
- C There are no selection pressures for organisms on islands.
- D There is no competition for food on islands.

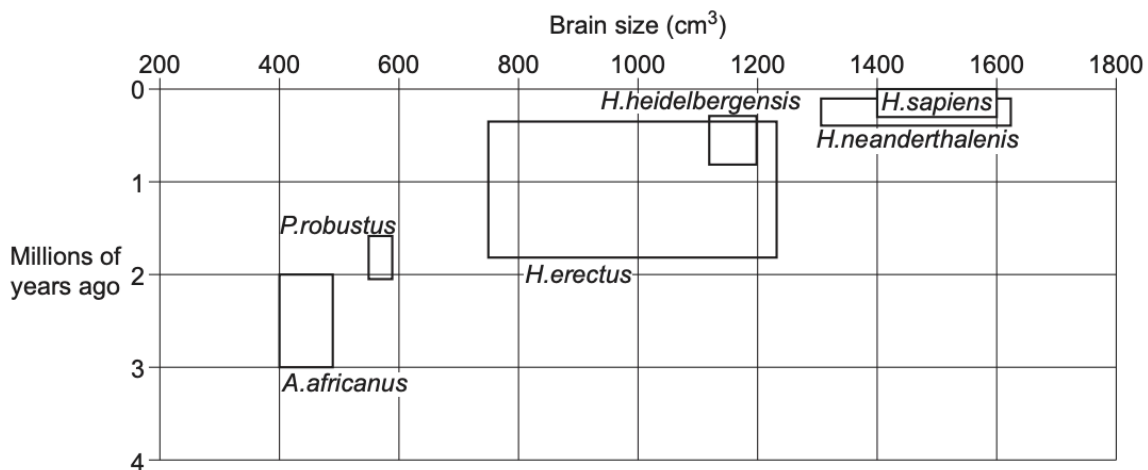
Your answer

[1]

Q15. (Nov 2020)

- 9 Humans belong to the species *H.sapiens*.

H.sapiens have evolved from a number of possible ancestors. The graph shows five of these ancestors.



What conclusion about human evolution can be made from the graph?

- A A larger brain meant that the species were better adapted to their environment.
- B *H.sapiens* outcompeted the other species which then became extinct.
- C In general, the more recently a species first appears, the larger its brain size.
- D There is no correlation between brain size and when a species first appeared.

Your answer

[1]

Q16. (Nov 2020)

15 What is meant by the term phylogenetics?

- A** Classifying organisms using many common characteristics.
- B** Constructing diagrams to predict how characteristics are inherited.
- C** The study of evolutionary relationships based on molecular studies.
- D** Using a single common feature to determine evolutionary relationships.

Your answer

[1]

Q17. (Nov 2020)

17 Zebras (Fig. 17.1) have evolved to live in hot grassland in Africa.

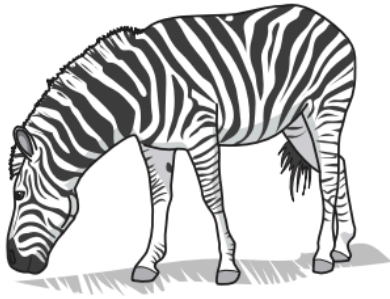


Fig. 17.1

(a) Scientists have tried to find out why zebras have evolved stripes on their body.

One theory is that the stripes help to keep the zebra cooler than other colours. Scientists did an experiment to test this theory. They covered barrels of cold water with the skin of different animals. Then they measured the temperature of the water several hours later.

The results are shown in Fig. 17.2.

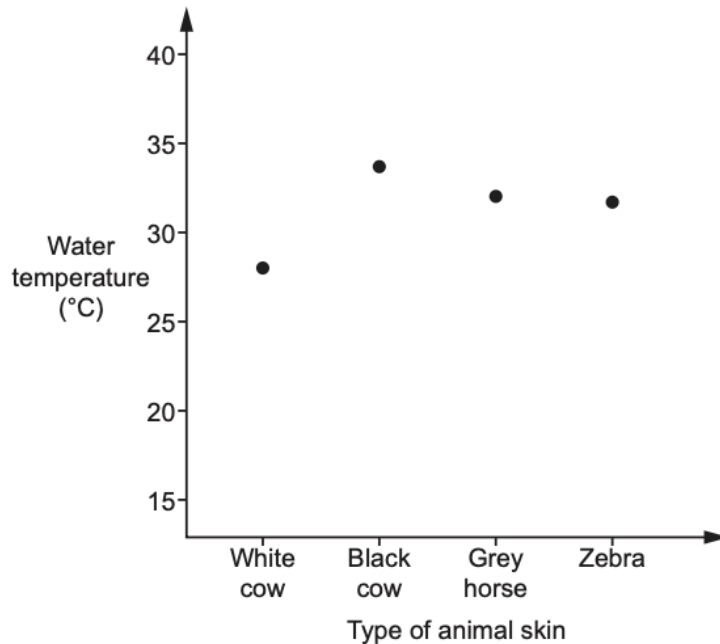


Fig. 17.2

(i) Do the results in Fig. 17.2 support the theory that stripes keep zebras cool? Explain your answer.

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- (ii) The scientists were aiming to investigate if it was **only** the colour of the skin that affected temperature regulation.

Suggest **one** improvement the scientists could make to ensure they **only** investigate the **colour** of the skin.

Explain your answer.

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- (b) Another theory says that the stripes make a zebra less likely to be bitten by insects.

To test this theory scientists made models of zebras and covered them with sticky tape. One model was black. The other models had different widths of stripes.

Fig. 17.3 shows the number of insects that stuck to the tape.

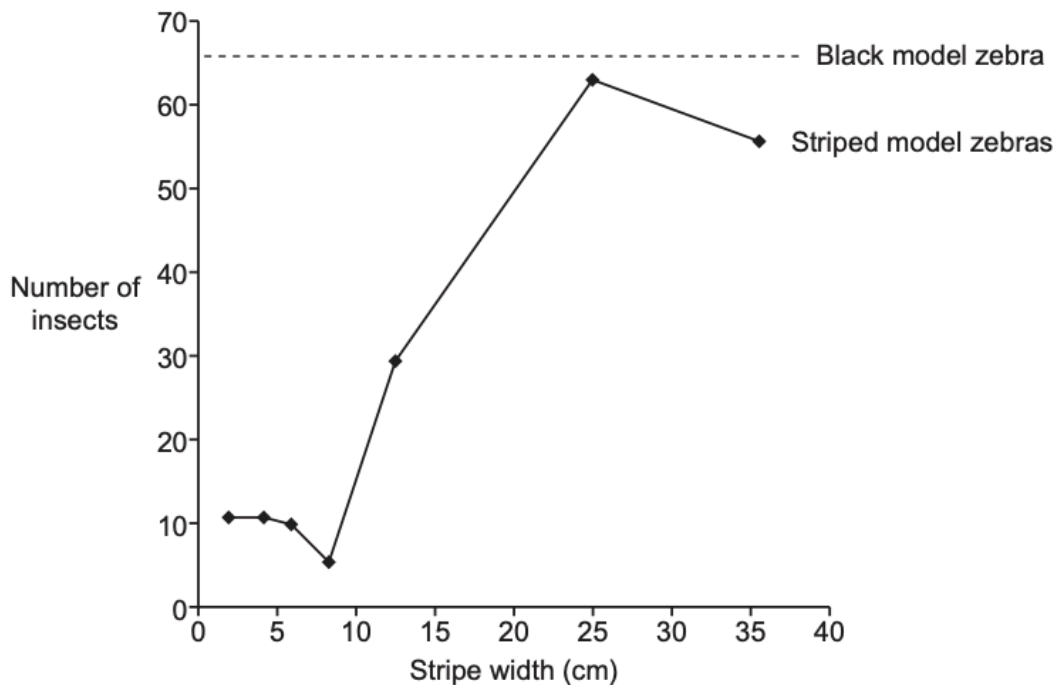


Fig. 17.3

- (i) Describe what **Fig. 17.3** shows about the link between zebra stripes and protection from insects.

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- (ii) Horse blankets are used to cover horses when they are outside. Companies have started to produce horse blankets with zebra stripes.

Use the information in **Fig. 17.3** to suggest what width of stripe should be used to reduce insect bites.

Explain your answer.

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- (iii) Biting insects can spread pathogens between animals.

Use the theory of natural selection to explain how zebra stripes could have developed.

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- 14** Researchers studied over 200 DNA samples from giraffe cells. Some populations of giraffe, which were geographically isolated, were found to be genetically very similar.

Which technique would the researchers have used to find that the giraffe populations were genetically similar?

- A** Cloning using stem cells
- B** DNA sequencing
- C** Genetic engineering
- D** Transcription

Your answer

[1]

Q19. (Nov 2021)

- 23** This question is about the evolution of plants and animals on Earth.

(a) What is meant by the term evolution?

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(b) Describe the work of Charles Darwin which led him to develop a theory of how evolution could occur.

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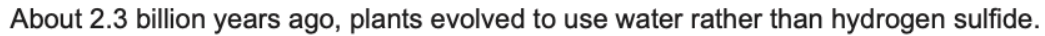
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- They lived in an environment that contained little oxygen.
- They made glucose by photosynthesis using hydrogen sulfide (H_2S).
- Sulfur was made as a waste product.



- Explain why the change from using hydrogen sulfide to water allowed larger primary consumers to live and why this meant that secondary consumers could also exist.

[6]

- (d) Scientists think that the presence of secondary consumers (predators) caused primary consumers (prey) to evolve much more quickly.

Explain why this statement may be true.

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