

Natural Selection and Evolution (F)

1. Seedbanks store many types of seed for long periods of time.

Why were seedbanks set up?

- A To act as a store of biodiversity.
- B To be used to feed animals if food is short.
- C To store pathogens for future use.
- D To supply seeds to farmers at a cheaper cost.

Your answer

[1]

2. What is meant by the term **natural classification**?

- A Classifying organisms according to their uses.
- B Classifying organisms using many of their common characteristics.
- C Using a key to classify organisms.
- D Using a single feature to classify organisms.

Your answer

[1]

3. What are the names of the two scientists who first suggested the theory of natural selection?

- A. Darwin and Mendel
- B. Mendel and Wallace
- C. Wallace and Darwin
- D. Watson and Crick

Your answer

[1]

4. Strains of bacteria are now becoming resistant to antibiotics.

Which process is causing this resistance?

- A Genetic modification
- B Natural classification
- C Natural selection
- D Selective breeding

Your answer

[1]

5. Zebras (**Fig. 23.1**) have evolved to live in hot grassland in Africa.

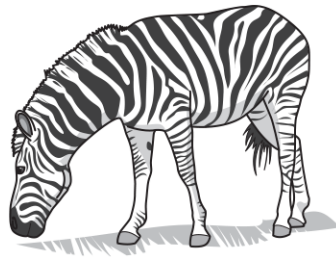


Fig. 23.1

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. 23.2**.

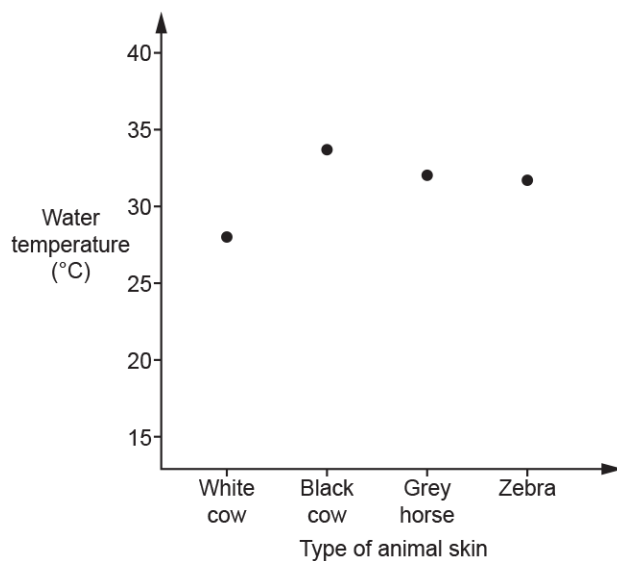


Fig. 23.2

- i. Do the results in **Fig. 23.2** support the theory that stripes keep zebras cool? Explain your answer.

[1]

- 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.

[1]

(d). Scientists are now trying to find another poison to use on rats.

They have introduced a chemical called phosphine. This blocks the action of mitochondria in rat cells.

Explain why this might kill rats.

[3]

7. The rock pocket mouse is a small grey coloured mouse that lives in Mexico.

These mice are the main food for owls.

Rattlesnakes also feed on these mice. In most areas of Mexico the ground is covered in grey rocks.

In one area the ground is covered with black rocks.

The black rocks were formed about 1000 years ago when a volcano erupted.

Scientists make two observations:

- very occasionally a black mouse is born to grey parents due to a mutation
- black mice are well camouflaged.

Use these observations to explain why most of the mice in this area are black and not the usual grey.

[4]

8. Zebras (**Fig. 23.1**) have evolved to live in hot grassland in Africa.

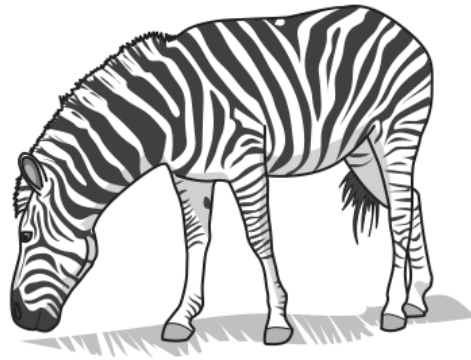


Fig. 23.1

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. 23.3 shows the number of insects that stuck to the tape.

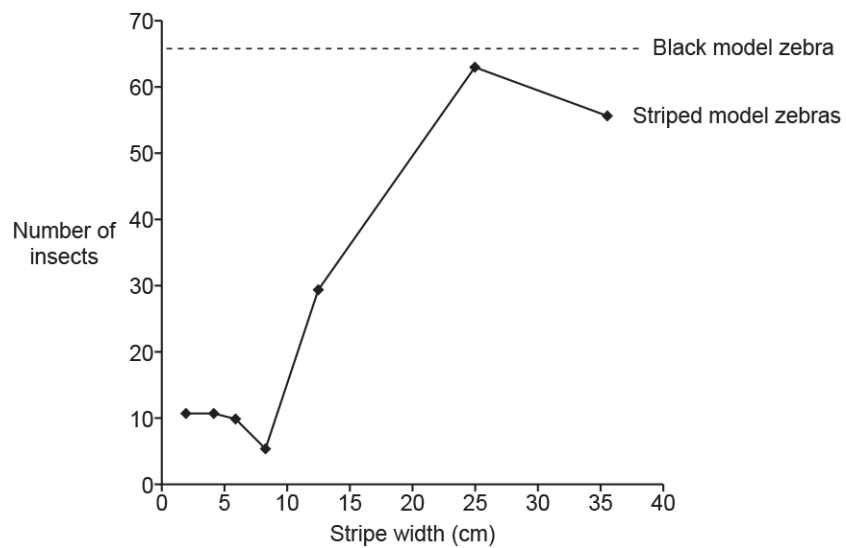


Fig. 23.3

- i. Describe what **Fig. 23.3** shows about the link between zebra stripes and protection from insects.

[2]

- 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. 23.3** to suggest what width of stripe should be used to reduce insect bites. Explain your answer.

----- [1]

- iii. Biting insects can spread pathogens between animals.

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

----- [3]

9. Hedgehogs are covered in small spines.

When they are frightened they often roll up into a ball and keep still.



- i. In country areas, where badgers live, this is an advantage to the hedgehogs.

In cities, where there are many roads, this is a disadvantage.

Explain these two conclusions.

----- [2]

- ii. Scientists have noticed that a new type of hedgehog is increasing in numbers in cities.

These hedgehogs do not roll up. They run away when frightened. The scientists think that genes control this behaviour.

Explain how this type of hedgehog may become more common in cities.

Use ideas about natural selection.

[4]

END OF QUESTION PAPER