OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



EXAM QUESTION PACK

B6.1 HOW WAS THE THEORY OF EVOLUTION DEVELOPED? (FOUNDATION)

SCORE	PERCENTAGE
/56	%

STEMUP

These questions belong to OCR, not to us.

The examination questions, mark schemes and examiner comments in this pack were written and published by OCR. They are past assessment materials, reproduced here so that students can revise from them.

What we do not own

STEMUP is not affiliated with OCR and does not own, and makes no claim to own, any of the question, mark scheme or examiner report material in this pack. OCR has not endorsed, approved or been involved in the production of it. OCR and the qualification titles used here belong to their respective owners and appear for identification only.

Where to find the originals

OCR publishes its past papers, mark schemes and examiner reports. Always check the current specification at ocr.org.uk before you revise, because content and wording can change between series.

If you hold the rights to any material in this pack and would like it amended or removed, contact admin@stemup.co.uk and we will act on it.

1. Fill in the gaps in the paragraph below with the best term from the list.

resistant	genes	selective breeding	immune
natural selection	chromosomes	offspring	

A wheat breeder notices that some of his wheat plants do not die when attacked by a fungus.

These plants are _____ to the fungus. He uses these plants to breed from and selects from their _____ to breed the next generation. This is an example of _____.

[3]

© OCR 2019.

STEMUP.CO.UK

2(a). Lamarck, Darwin and Wallace were three scientists responsible for our understanding of evolution.



Jean Baptiste Lamarck



Charles Darwin



Alfred Russel Wallace

In the early 1800s, most scientists such as Lamarck thought that when organisms acquired a characteristic during their life time, they could pass this characteristic on to their offspring. He thought that the giraffe had a long neck because it stretched to reach leaves from the branches of trees. He thought that giraffes that stretched their necks the most would then pass on this characteristic to their offspring.

Darwin and Wallace did not believe this theory. They spent many years collecting different species of animals and plants from all over the world and they both came to the same conclusion.

Darwin and Wallace thought that life evolved due to a process of natural selection. Both Darwin and Wallace realised that if this process was repeated over many generations, it could lead to the wide variety of different species that we see around us today.

Today most scientists around the world believe Darwin's and Wallace's theory to be correct.

(i) Evaluate Lamarck's theory and suggest why most scientists now believe Darwin and Wallace's theory of evolution.

© OCR 2019.

STEMUP.CO.UK

[4]

(ii) Wallace sent Darwin his ideas to check that he had not made any mistakes.

Put a tick (✓) in the box next to the statement that best describes this process.

Repeatability	
Controlling variables	
Extrapolation	
Peer review	

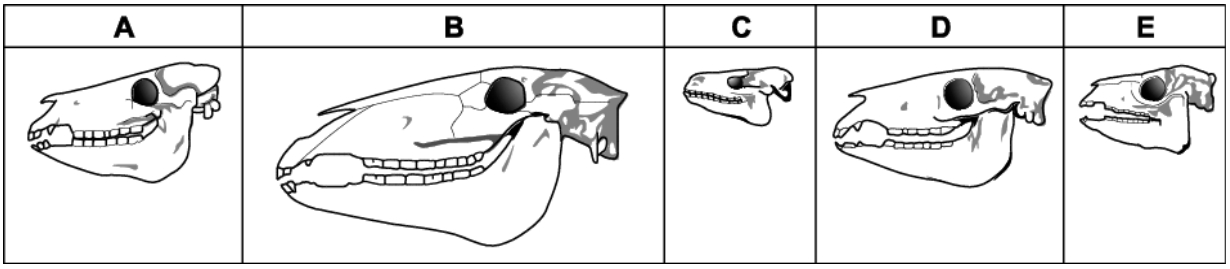
[1]

(b). Scientists use fossils to provide evidence for evolution.

The five drawings below are of fossil skulls of horses.

The drawings, **A**, **B**, **C**, **D** and **E** can be used to show how horses have evolved.

The drawings are in the wrong order.



Complete the boxes to show how the horses have evolved.

The first and last have been done for you.

C				**B**

[2]

© OCR 2019.

STEMUP.CO.UK

(c). Describe how the fossils can be used to provide evidence for the evolution of horses.

Use ideas of similarities and differences between the drawings and your own knowledge in your answer.

---[4]

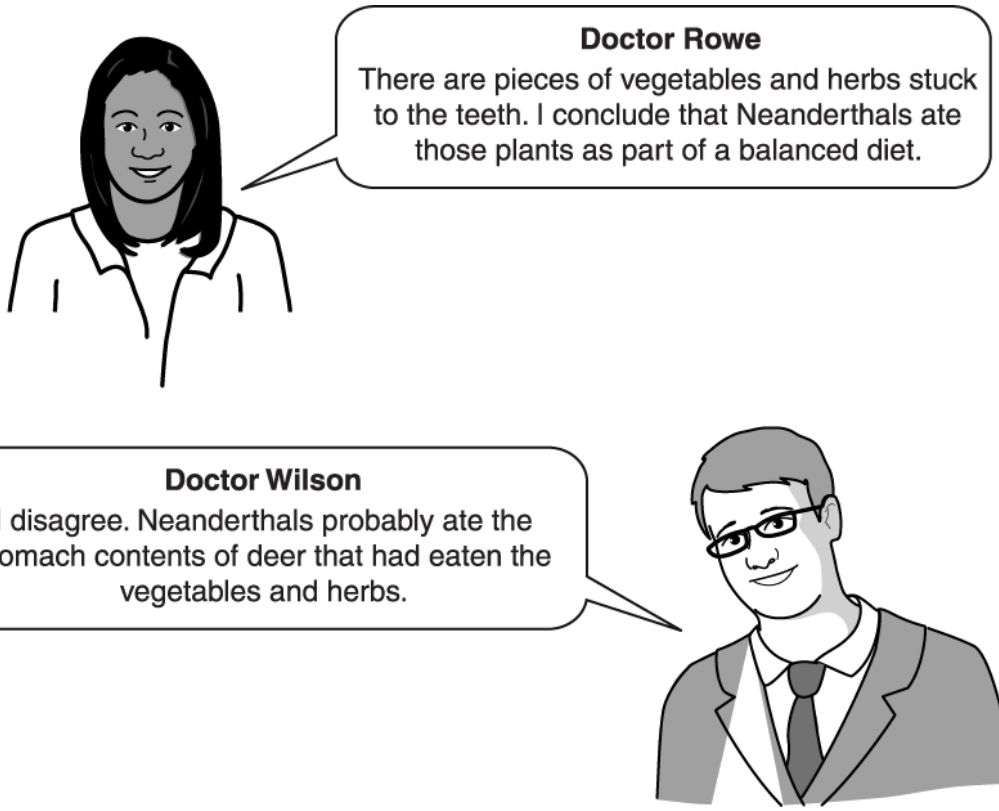
STEMUP.CO.UK

3. Neanderthals are an extinct species of humans.



Fossils of Neanderthals help us investigate the evolution of humans.

Two scientists talk about fossils of Neanderthal teeth.



Complete the table.

Put **one** tick (✓) in each row to answer the questions.

STEMUP.CO.UK

	Only Doctor Rowe	Only Doctor Wilson	Both scientists	Neither scientist
Who describes data?				
Who suggests an explanation for the data?				
Who has used creative thinking to develop an explanation?				

[3]

© OCR 2019.

STEMUP.CO.UK

4. Neanderthals and modern humans are different species.

Both species evolved from the same ancestor.

Statements **A** to **E** show steps in the process of evolution.

The statements are in the wrong order.

A The groups lived in isolation in different conditions.
B Some individuals were better able to survive to reproduce.
C The ancestor population split into two groups.
D The groups evolved to become two different species.
E Mutations caused genetic variation in each group.

Write the letters in the boxes to show the correct order.

One has been done for you.



[3]

© OCR 2019.

STEMUP.CO.UK

5(a). In 2011, a huge earthquake in Japan caused a radiation leak from a nuclear power station.

Two months later, butterflies were collected in a number of different areas near the power station.

Some of the butterflies had much smaller wings than normal butterflies, and irregular shaped eyes.

Some scientists believe that the radiation caused a random change in the genes of the butterflies.

What name is given to a random change in a gene?

Put a (ring) around the correct answer.

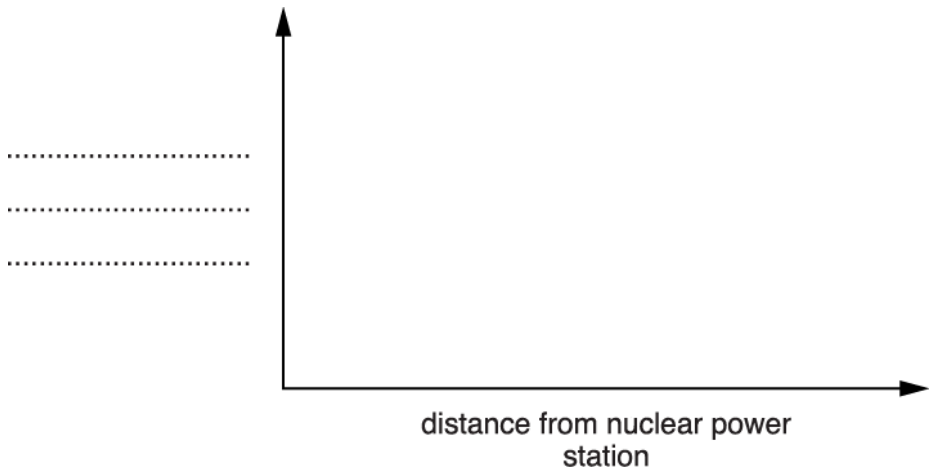
evolution isolation mutation variation

[1]

STEMUP.CO.UK

(b). Butterflies collected closer to the power station had more genetic changes than those collected further away.

Scientists start to draw a graph to show their results.



(i) On the graph:

- complete the axis label
- draw a line to show the relationship between the distance from the nuclear power station and the number of genetic changes.

[2]

(ii) Scientists cannot be certain that radiation is causing the genetic changes in the butterflies.

Suggest why.

---

[2]

STEMUP.CO.UK

(c). Genetic changes can contribute to the process of natural selection.

Explain how.

[3]

6. There is a huge variation of life on Earth.

The processes of natural selection and selective breeding have been involved in producing this variation.

Compare natural selection and selective breeding.

Include the similarities and differences between the two processes.

The quality of written communication will be assessed in your answer.

[6]

STEMUP.CO.UK

7(a). The process of evolution has produced many new species.

Explain how evolution produces new species.

The quality of written communication will be assessed in your answer.

[6]

(b). A team of scientists are looking for new species in the Amazon jungle.

They discover an unusual beetle.

Explain what would prove that it was a new species.

[2]

STEMUP.CO.UK

8(a). Bulldogs are an example of a breed of dog that has been selectively bred.

(i) Describe how dogs are selectively bred.

---[2]

(ii) Explain the impact of selective breeding on domesticated animals such as dogs.

---[1]

(b). A cockapoo is a dog that results from the mating of two different breeds of dog; a cocker spaniel and a poodle.

The cockapoo is not a new species.

Explain why.

---[2]

© OCR 2019.

STEMUP.CO.UK

9. The Galapagos Islands are a group of 13 islands found in the Pacific Ocean.

Charles Darwin visited the Galapagos Islands during the 19th century.

He collected samples and made many observations.

This work helped Darwin to develop a new explanation for the evolution of species.

(i) Which of the following are observations made by Darwin?

Tick (✓) **two** boxes.

There are differences between fossils and living examples of similar organisms. ☐

Pea plants with red flowers can produce offspring with white flowers. ☐

There is usually extensive variation within a population of a species. ☐

Some bacteria have become resistant to antibiotics. ☐

Isolated populations of the same species living in different places have different characteristics. ☐

[2]

(ii) Darwin suggested a theory to explain his observations.

Write down the name of the theory he suggested.

---

[1]

© OCR 2019.

STEMUP.CO.UK

10. Warfarin is a medicine that helps to prevent the formation of blood clots.

It is given to people who are at risk from a blood clot blocking one of their veins.

* Warfarin has also been used as rat poison since 1948.

However, many populations of rats are now resistant to warfarin.

Explain how a population of rats could have become resistant to warfarin.

---

[6]

END OF QUESTION PAPER

© OCR 2019.

STEMUP.CO.UK