AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.6.3.3

Extinction

Past-paper questions

Tier	**Foundation**
Question groups	**6**
Available paper years	**2019–2025**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.6.3.3 Extinction

Question 01

June 2019 | 8464/B/2F | Original Q3

0 3 Animals have adaptations to survive in their environment.

These adaptations may be structural, behavioural or functional.

0 3 . 1 Draw **one** line from each animal adaptation to the type of adaptation it is.

[2 marks]

Animal adaptation	Type of adaptation
 Male palm cockatoos use sticks to beat on hollow branches to attract females.	Structural
 The harmless hornet moth has black and yellow stripes to look like a bee or wasp.	Behavioural
 Sea spiders have automatic muscle contractions that move oxygen around their bodies.	Functional

4.6.3.3 Extinction

Question 01 · continued

Plants also have adaptations.

Orchid plants have adaptations which make them one of the most successful plant groups.

Orchids rely on insects for pollination.

Figure 2 shows an orchid.

Figure 2



0 3 . 2 Which **two** features help orchids survive?

[2 marks]

Tick (✓) **two** boxes.

- Brightly coloured flowers ☐
- Large quantities of pollen ☐
- No scent ☐
- Oval shaped leaves ☐
- Small leaves ☐

4.6.3.3 Extinction

Question 01 · continued

Many orchid species grow in tropical rainforest ecosystems.

0 3 . 3 What name describes the variety of all the different species found in an ecosystem?

[1 mark]

Tick (✓) **one** box.

- Biodiversity ☐
- Evolution ☐
- Feeding relationship ☐
- Habitat ☐

0 3 . 4 Some species of orchid may become extinct because of deforestation.

Give **one** reason why tropical rainforests are being cut down.

[1 mark]

0 3 . 5 Give **one** factor that might cause a species of orchid to become extinct.

Do **not** refer to deforestation in your answer.

[1 mark]

Scientists have analysed the entire genetic material of one species of orchid.

0 3 . 6 What chemical is the genetic material made from?

[1 mark]

0 3 . 7 What is the name for the entire genetic material of an organism?

[1 mark]

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4.6.3.3 Extinction

Question 02

November 2020 | 8464/B/2F | Original Q2

0 2 Ammonites became extinct millions of years ago.

Figure 2 is a photograph of a fossil ammonite.

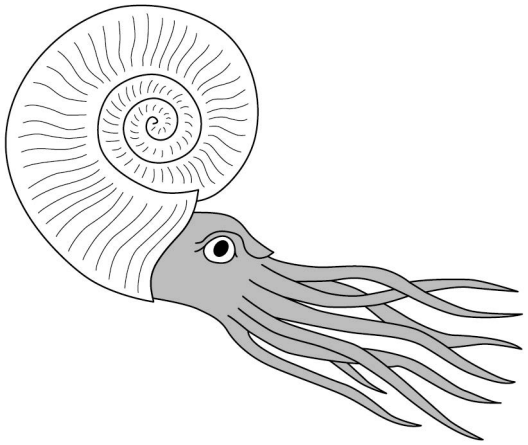
.

Figure 3 is a drawing of what scientists think a living ammonite looked like.

Figure 2



Figure 3



0 2 . 1 How was the fossil in **Figure 2** formed?

[1 mark]

Tick (✓) **one** box.

The ammonite left traces where it moved. ☐

The ammonite shell was replaced by minerals. ☐

The ammonite was frozen in ice. ☐

0 2 . 2 Suggest why scientists are **not** certain what living ammonites looked like.

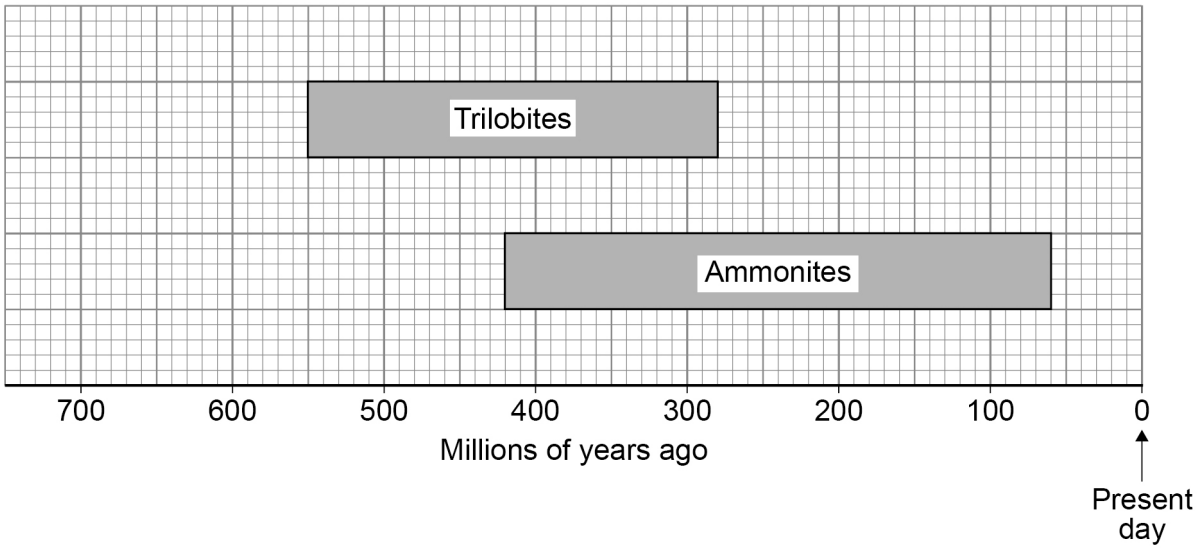
[1 mark]

4.6.3.3 Extinction

Question 02 · continued

Figure 4 shows when two different types of organism were alive on Earth.

Figure 4



0 2 . 3 How many millions of years ago did ammonites become extinct?

Use **Figure 4**.

[1 mark]

_____ million years

0 2 . 4 Trilobites lived on Earth for 270 million years.

Calculate how much longer ammonites lived on Earth than trilobites.

Use **Figure 4**.

[2 marks]

_____

_____

_____ million years

4.6.3.3 Extinction

Question 02 · continued

0 2 . 5 Suggest **two** factors which may have caused ammonites to become extinct.

[2 marks]

1 _____

_____

2 _____

_____

The fossil record provides evidence for the theory of evolution by natural selection.

0 2 . 6 Which scientist proposed the theory of evolution by natural selection?

[1 mark]

Tick (✓) **one** box.

Carl Linnaeus ☐

Carl Woese ☐

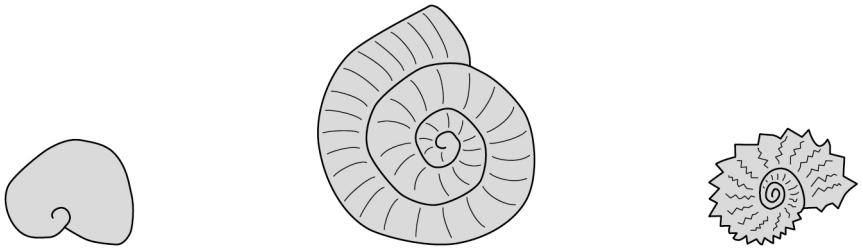
Charles Darwin ☐

4.6.3.3 Extinction

Question 02 · continued

0 2 . 7 **Figure 5** shows ammonite fossils from three different time periods.

Figure 5



400 million years ago | 300 million years ago | 200 million years ago

How do the fossils in **Figure 5** give evidence for the theory of evolution by natural selection?

[1 mark]

Tick (✓) **one** box.

All fossils have coiled shells. ☐

More recent fossils are bigger. ☐

Older fossils are more simple. ☐

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4.6.3.3 Extinction

Question 03

November 2021 | 8464/B/2F | Original Q4

0 4 A fossil was found in rocks. The rocks were formed from mud.

The fossil is of the fungus *Ourasphaira giraldae*.

0 4 . 1 What is the genus of the fungus?

[1 mark]

Tick (✓) **one** box.

- Giraldae ☐
- Ourasphaira ☐
- Ourasphaira giraldae ☐

0 4 . 2 The mud around the fungus did **not** contain oxygen.

Which process did the mud around the fungus prevent?

[1 mark]

Tick (✓) **one** box.

- Decay ☐
- Geological activity ☐
- Photosynthesis ☐

Question 4 continues on the next page

4.6.3.3 Extinction

Question 03 · continued

0 4 . 3 The fossilised fungus is estimated to be 890 000 000 years old.

What is 890 000 000 in standard form?

[1 mark]

Tick (✓) **one** box.

8.9×10^6 ☐

8.9×10^7 ☐

8.9×10^8 ☐

8.9×10^9 ☐

0 4 . 4 Traditional classification divided organisms into kingdoms.

Who developed the traditional system of classification?

[1 mark]

Tick (✓) **one** box.

Carl Linnaeus ☐

Carl Woese ☐

Charles Darwin ☐

4.6.3.3 Extinction

Question 03 · continued

0 4 . 5 More recent classification methods use a three-domain system.

What is the name of the domain the fungus *Ourasphaira giraldae* is classified in?

[1 mark]

Tick (✓) **one** box.

Bacteria ☐

Eukaryota ☐

Plants ☐

0 4 . 6 Why has classification changed over time?

[1 mark]

Tick (✓) **one** box.

Electron microscopes allow more detail to be seen inside cells. ☐

Many more types of organisms have become extinct. ☐

Some fossils are buried so deep that they may never be discovered. ☐

0 4 . 7 The fungus *Ourasphaira giraldae* is now extinct.

Give **two** possible causes of extinction.

[2 marks]

1 _____

_____

2 _____

_____

8

4.6.3.3 Extinction

Question 04

June 2023 | 8464/B/2F | Original Q7

0 7 It is estimated that 99.9% of all species that have ever existed are now extinct.

0 7 . 1 Why is the percentage of species that are extinct only an estimate?

[1 mark]

Tick (✓) **one** box.

All individuals of one species have the same genes. ☐

Extinction is always caused by humans. ☐

Humans have not found evidence of every species. ☐

0 7 . 2 What evidence is used to study species that have become extinct?

[1 mark]

4.6.3.3 Extinction

Question 04 · continued

0 7 . 3 A bacterium called *Clostridioides difficile* (*C. difficile*) can infect the human digestive system.

C. difficile can multiply and produce toxins. The toxins cause diarrhoea.

Doctors are concerned that new strains of *C. difficile* may evolve. Antibiotics may **not** be able to kill these new strains.

Explain how the evolution of antibiotic resistant *C. difficile* can be slowed down.

[6 marks]

8

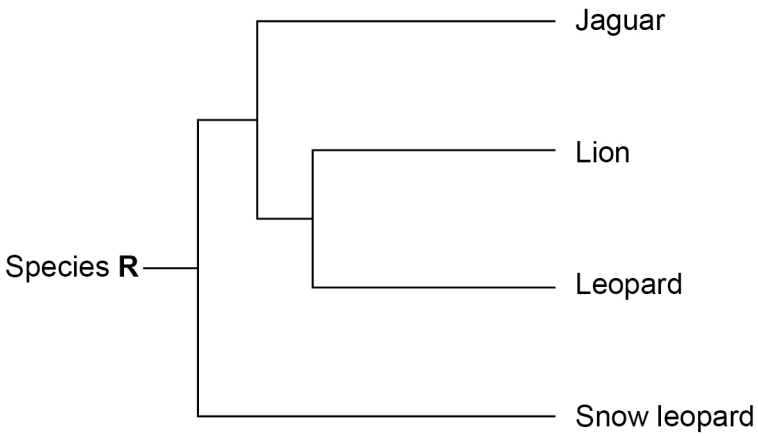
4.6.3.3 Extinction

Question 05

June 2024 | 8464/B/2F | Original Q4

0 4 **Figure 8** shows an evolutionary tree.

Figure 8



0 4 . 1 Which species in **Figure 8** is most closely related to lions?

[1 mark]

Tick (✓) **one** box.

Jaguar ☐

Leopard ☐

Snow leopard ☐

0 4 . 2 Tigers are more closely related to snow leopards than to jaguars.

Draw a line on **Figure 8** to show the evolution of tigers.

Label the line 'Tiger'.

[1 mark]

4.6.3.3 Extinction

Question 05 · continued

0 4 . 3 What is represented by species **R** on **Figure 8**?

[1 mark]

Tick (✓) **one** box.

A species recently evolved from jaguars. ☐

A species that may evolve in the future. ☐

A species that the other species evolved from. ☐

0 4 . 4 Complete the sentence.

Choose the answer from the box.

[1 mark]

classification	**homeostasis**	**natural selection**

Evolution occurs by the process of _____.

0 4 . 5 Species can become extinct.

Give **two** possible causes of extinction.

[2 marks]

1 _____

_____

2 _____

_____

Question 4 continues on the next page

4.6.3.3 Extinction

Question 05 · continued

0 4 . 6 Fossils are used to study the evolution of some species.

Suggest **one** reason why fossils are used to study evolution.

[1 mark]

Some bacteria have evolved to be resistant to penicillin.

Penicillin is an antibiotic.

0 4 . 7 How has the process of evolution produced bacteria that are resistant to penicillin?

Write the stages, **A**, **B**, **C**, **D** and **E** in the correct order.

The first stage has been completed for you.

[3 marks]

A The bacteria with mutations are more likely to survive.

B The population of bacteria is exposed to penicillin.

C The mutation for resistance to penicillin is passed on to offspring.

D Variation in the population of bacteria is caused by mutation.

E The surviving bacteria reproduce.

D → _____ → _____ → _____ → _____

4.6.3.3 Extinction

Question 05 · continued

0 4 . 8 New antibiotics are **not** likely to control the spread of bacteria that are resistant to antibiotics.

What are **two** reasons why?

[2 marks]

Tick (✓) **two** boxes.

- Antibiotics kill all types of bacteria. ☐
- Antibiotic resistant bacteria will continue to evolve. ☐
- Bacteria reproduce very rapidly. ☐
- New antibiotics are cheap to produce. ☐
- Testing new antibiotics is quick. ☐

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Turn over for the next question

4.6.3.3 Extinction

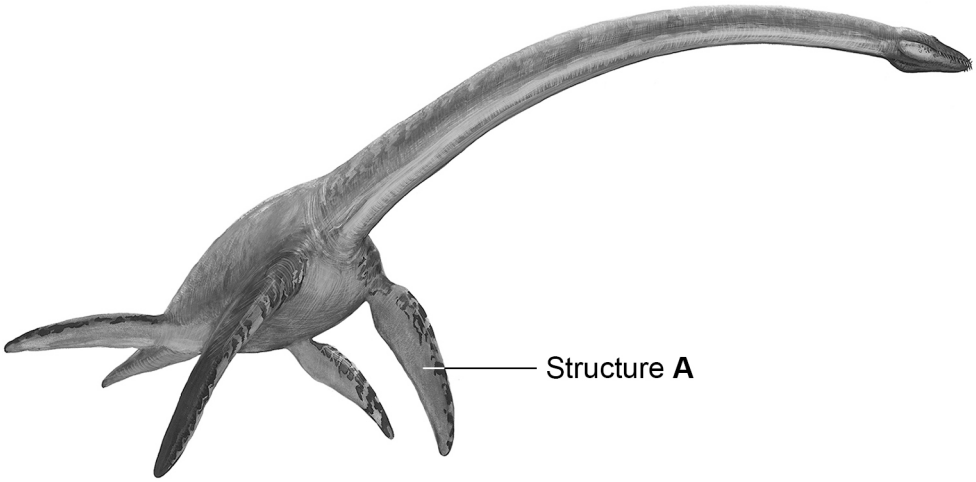
Question 06

June 2025 | 8464/B/2F | Original Q4

0 4 Plesiosaurs are extinct animals that lived in the ocean.

Figure 5 shows what scientists think a living plesiosaur may have looked like.

Figure 5



0 4 . 1 Scientists think that the plesiosaur had smooth skin.

Suggest why the scientists **cannot** be certain what the skin of the plesiosaur was like.

[1 mark]

0 4 . 2 Explain how structure **A** in **Figure 5** helped the plesiosaur survive in the ocean.

[2 marks]

4.6.3.3 Extinction

Question 06 · continued

0 4 . 3 Plesiosaurs may have moved rapidly upwards to hold their heads above the water surface to search for prey.

What type of adaptation was the rapid upwards movement?

[1 mark]

Tick (✓) **one** box.

Behavioural ☐

Chemical ☐

Structural ☐

Question 4 continues on the next page

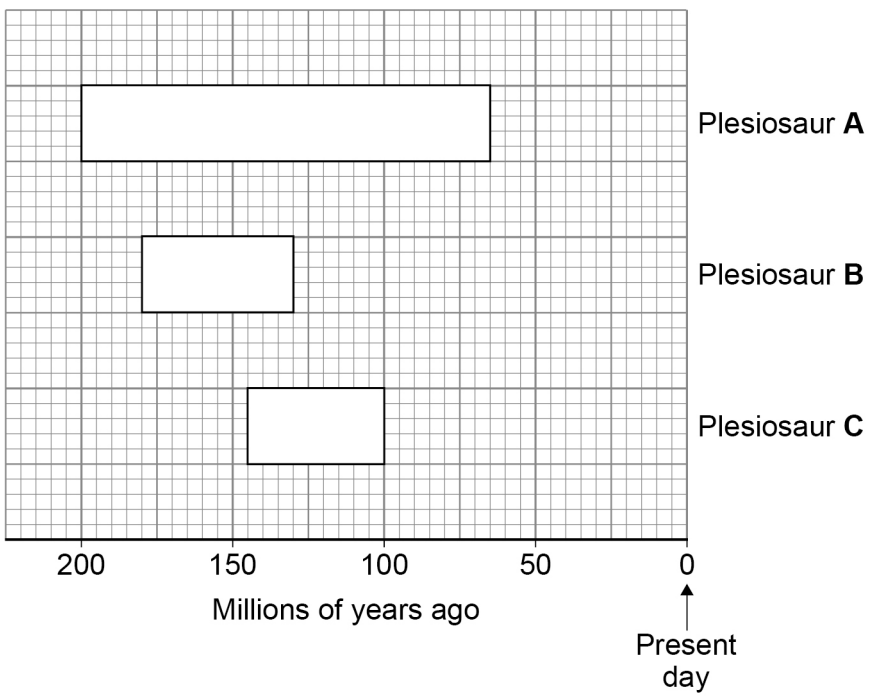
4.6.3.3 Extinction

Question 06 · continued

Scientists use fossils to estimate when different types of plesiosaur existed.

Figure 6 shows when three types of plesiosaur existed.

Figure 6



0 4 . 4 When did plesiosaur **A** first evolve?

Use **Figure 6**.

[1 mark]

_____ million years ago

0 4 . 5 Determine how many million years plesiosaur **B** existed for.

Use **Figure 6**.

[2 marks]

_____

_____

_____

Time = _____ million years

4.6.3.3 Extinction

Question 06 · continued

0 4 . 6 The exact year of extinction of all plesiosaur species can only be estimated.

Which are **two** reasons why?

[2 marks]

Tick (✓) **two** boxes.

- All plesiosaurs will have formed fossils. ☐
- Not all plesiosaur fossils have been discovered. ☐
- Plesiosaur bones do not decay. ☐
- Plesiosaurs had many predators. ☐
- Some plesiosaur fossils will have been destroyed. ☐

0 4 . 7 What evidence from **Figure 6** shows that plesiosaur **C** might have evolved from plesiosaur **B**?

[1 mark]

Tick (✓) **one** box.

- Plesiosaur **B** and plesiosaur **C** did not exist at the same time. ☐
- Plesiosaur **B** existed before plesiosaur **C**. ☐
- Plesiosaur **B** became extinct more recently than plesiosaur **C**. ☐

Question 4 continues on the next page

4.6.3.3 Extinction

Question 06 · continued

0 4 . 8 Evolution can be studied using evidence from:

- fossils
- antibiotic-resistant bacteria.

Suggest **two** reasons why it is easier to study evolution in bacteria than to study evolution using fossils.

[2 marks]

1 _____

_____

2 _____

_____

0 4 . 9 Give **one** reason why doctors are concerned about antibiotic-resistant bacteria.

[1 mark]

_____

_____

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