AQA GCSE Biology | 8461

SPECIFICATION POINT 4.6.4

Classification of living organisms

Past-paper questions

Tier	**Foundation**
Question groups	**11**
Available paper years	**2008–2025**

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.

4.6.4 Classification of living organisms

Question 01

November 2008 | BLY1BP | Original Q8 | Legacy

QUESTION EIGHT

All species of living organisms have evolved from simple life forms.

8A There is very little evidence for the evolution of the earliest life forms.

This is because the remains of most early life forms . . .

1 have been destroyed by geological activity.

2 are buried under deep layers of rock.

3 are under the sea.

4 are too small to survive.

8B Scientists think that the earliest life forms first appeared on Earth . . .

1 about 1 billion years ago.

2 about 3 billion years ago.

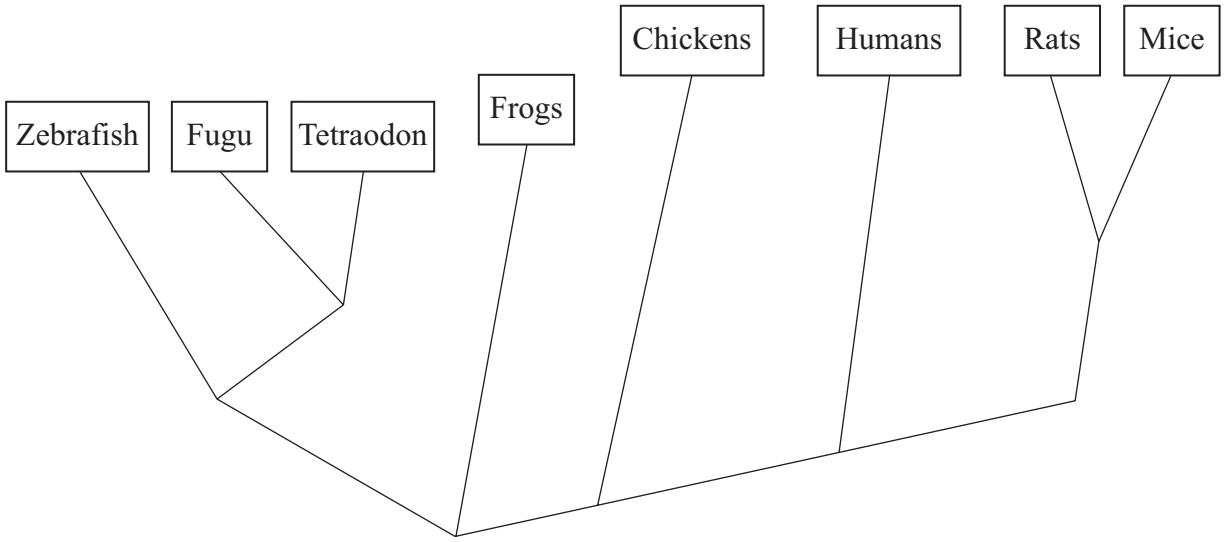
3 about 10 billion years ago.

4 about 30 billion years ago.

4.6.4 Classification of living organisms

Question 01 · continued

The diagram shows an evolutionary tree.



8C The evolutionary tree represents . . .

1 facts about evolution.

2 hearsay about evolution.

3 predictions about evolution.

4 a guess about evolution.

8D Differences between the rats and mice are mainly due to . . .

1 their environment.

2 their genes.

3 their different diet.

4 their ability to reproduce quickly.

4.6.4 Classification of living organisms

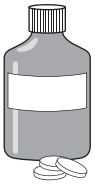
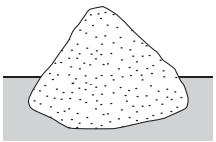
Question 02

3 Drugs affect our bodies.

3 (a) **List A** gives the names of four different substances.

List B gives information about different substances.

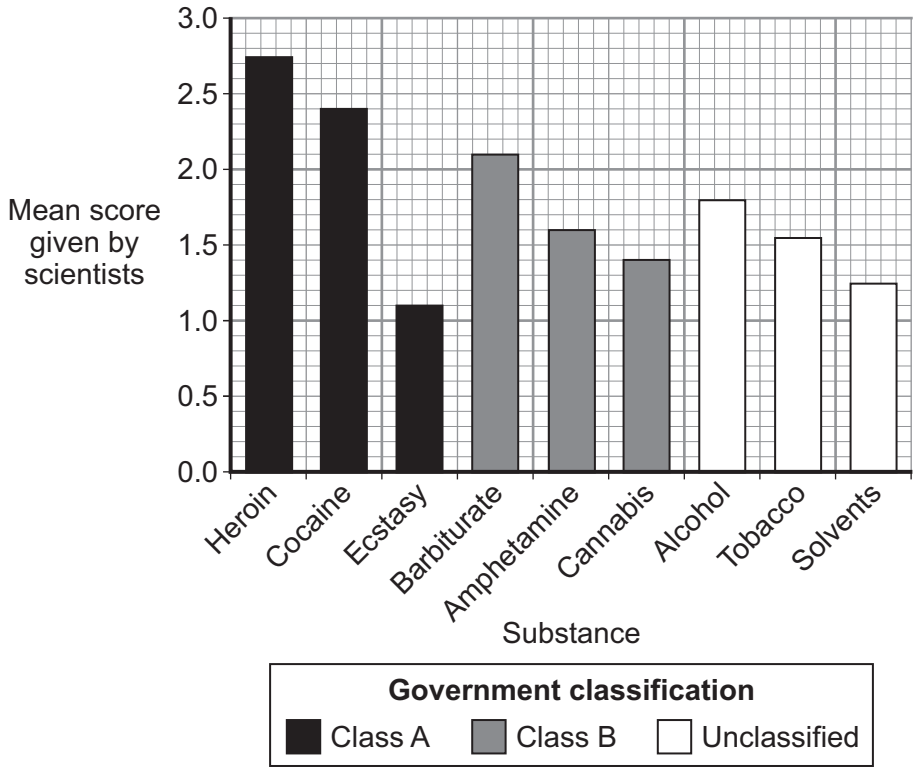
Draw **one** line from each substance in **List A** to the correct information about the substance in **List B**.

List A Substance	**List B Information**
Alcohol 	Used to treat bacterial diseases
Antibiotic 	A very addictive drug
Heroin 	May cause lung cancer
Cigarette smoke 	May cause babies to be born with abnormal limbs
	May cause liver disease

(4 marks)

Question 02 · continued

3 (b) A group of scientists was asked to say how much harm recreational drugs cause.
The scientists used a scale of 1–3, with 3 being the most harmful.
Their results are shown on the graph.
The government classifies drugs into three groups.
The groups are shown in the key below the graph.



3 (b) (i) Name the drug which **scientists** think is least harmful.

.....

(1 mark)

3 (b) (ii) In the government classification, class A drugs are the most harmful and unclassified drugs are the least harmful.

Does the government classification agree with the scientists' classification for **all** the drugs?

Draw a ring around your answer. **Yes / No**

Give **one** piece of evidence from the graph to support your answer.

.....

.....

(1 mark)

Question 3 continues on the next page

4.6.4 Classification of living organisms

Question 02 · continued

3 (c) Draw a ring around the correct answer to complete the sentence.

People use recreational drugs

- to cure disease.
- to prevent diseases.
- for pleasure.

(1 mark)

7

4.6.4 Classification of living organisms

Question 03

January 2013 | BL1FP | Original Q5 | Legacy

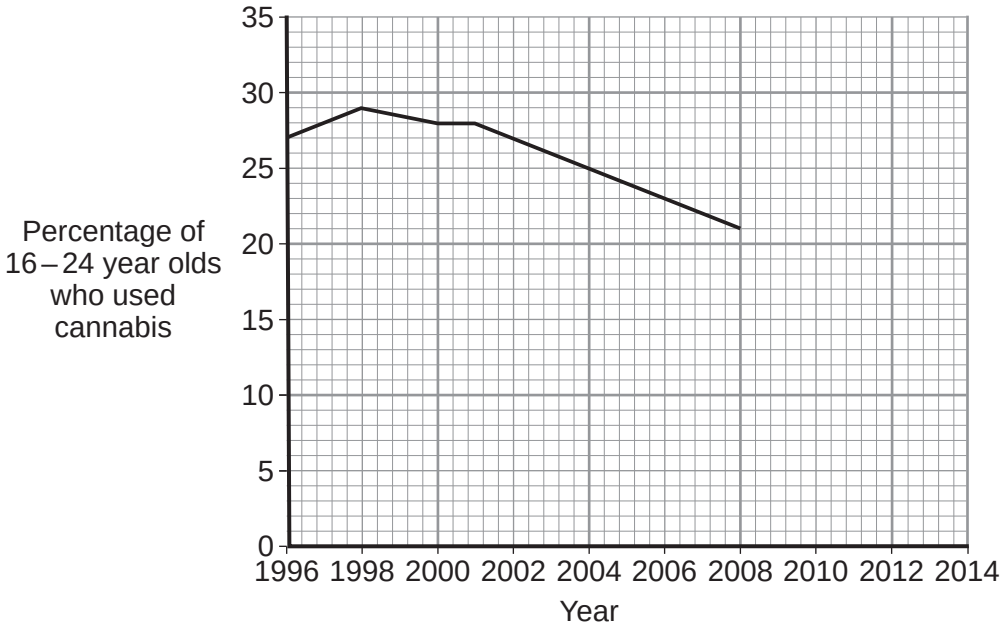
5 Cannabis is an illegal drug.

5 (a) What type of illness might be caused by smoking cannabis regularly?

.....

(1 mark)

5 (b) The graph shows the use of cannabis by 16–24 year olds in the UK between 1996 and 2008.



5 (b) (i) Use the graph to predict the percentage of 16–24 year olds who will use cannabis in 2014.

Show your working **on the graph**.

Percentage = ...

(2 marks)

4.6.4 Classification of living organisms

Question 03 · continued

5 (b) (ii) Illegal drugs are classified as Class A, Class B or Class C.
Class C drugs are the least dangerous.

In 2004, the government changed the classification of cannabis from Class B to Class C.

In 2009, the government changed the classification of cannabis back from Class C to Class B.

Do you think that changing the classification of cannabis back to a Class B drug will reduce the percentage of 16–24 year olds who use cannabis?

Use evidence from the graph to explain your answer.

.....

.....

.....

.....

.....

.....

(2 marks)

5

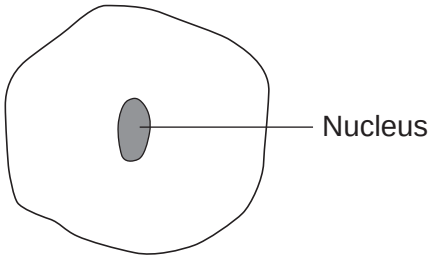
4.6.4 Classification of living organisms

Question 04

June 2014 | BL1FP | Original Q1 | Legacy

1 **Figure 1** shows a cell.

Figure 1



1 (a) Draw a ring around the correct answer to complete each sentence.

1 (a) (i) In the nucleus of a cell, genes are part of

chromosomes.
membranes.
receptors.

[1 mark]

1 (a) (ii) Different genes control different

characteristics
gametes
nuclei

of an organism.

[1 mark]

1 (a) (iii) Studying the similarities and differences between organisms allows us to

classify
clone
grow

the organisms.

[1 mark]

1 (b) Complete the following sentence.

[1 mark]

Living things can be grouped into animals, microorganisms and ..... .

4

4.6.4 Classification of living organisms

Question 05

0 5 **Figure 10** shows a flightless bird called the dodo (*Raphus cucullatus*).

Figure 10



The dodo:

- was 1 m tall
- had a mass of 20 kg
- lived in rainforests on a tropical island
- ate fruits
- made its nest on the ground.

A female dodo laid only one egg each year.

Humans arrived on the island in the year 1507. By 1681 the dodo was extinct.

0 5 . 1 What is the genus of the dodo?

[1 mark]

Tick (✓) **one** box.

Animal ☐

Bird ☐

Raphus ☐

4.6.4 Classification of living organisms

Question 05 · continued

0 5 . 2 Before the arrival of humans, there were no other large animals living on the island.

Suggest **two** reasons why the dodo became extinct soon after the arrival of humans.

[2 marks]

1 _____

_____

2 _____

_____

Today, humans are cutting down large areas of tropical rainforests.

0 5 . 3 Suggest **one** use of the land after the trees have been removed.

[1 mark]

_____

_____

0 5 . 4 Why does the removal of trees cause an increase in carbon dioxide in the atmosphere?

[2 marks]

Tick (✓) **two** boxes.

There are fewer animals. ☐

There is less photosynthesis. ☐

There is less respiration. ☐

The soil dries out. ☐

The trees are burned. ☐

Question 05 · continued

0 5 . 5 What effect would an increase in carbon dioxide in the atmosphere have on global air temperature?

[1 mark]

Tick (✓) **one** box.

Decrease ☐

Increase ☐

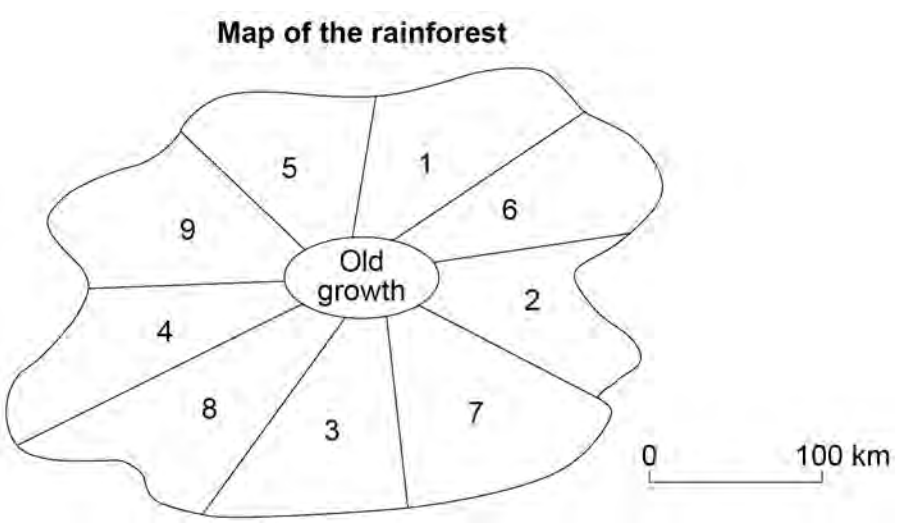
Stay the same ☐

'Sustainable forestry' reduces the harmful effects of cutting down trees on the environment.

Figure 11 shows a method of 'sustainable forestry'.

Numbers 1–9 show different parts of a rainforest.

Figure 11



The trees are cut down in the sequence 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9

- The trees are cut down in only one area at any one time.
- It takes 30 years to cut down the trees in each area.
- The trees in the 'Old growth' area are never cut down.

4.6.4 Classification of living organisms

Question 05 · continued

0 5 . 6 How many years would it take to cut down the trees in all of the numbered areas in **Figure 11**?

[2 marks]

Number of years = _____

0 5 . 7 The rainforest contains:

- 750 species of trees
- 400 species of birds
- 150 species of butterflies
- many other species of plants and animals.

Explain how the pattern of cutting down trees shown in **Figure 11** stops the biodiversity of the rainforest being reduced.

[4 marks]

13

4.6.4 Classification of living organisms

Question 06

November 2020 | 8461/2F | Original Q6

0 6 **Figure 8** shows what the extinct Siberian rhinoceros (*Elasmotherium sibiricum*) might have looked like.

Figure 8



0 6 . 1 What is the genus of the Siberian rhinoceros?

[1 mark]

Tick (✓) **one** box.

Elasmotherium ☐

Elasmotherium sibiricum ☐

sibiricum ☐

4.6.4 Classification of living organisms

Question 06 · continued

The 'three-domain system' of classification places all living organisms in one of three domains.

0 6 . 2 Which domain was the Siberian rhinoceros in?

[1 mark]

Tick (✓) **one** box.

- Archaea ☐
- Eukaryota ☐
- Prokaryota ☐

0 6 . 3 Who developed the 'three-domain system' of classification?

[1 mark]

Tick (✓) **one** box.

- Carl Woese ☐
- Charles Darwin ☐
- Gregor Mendel ☐

0 6 . 4 The horn of the Siberian rhinoceros is estimated to have been 150 cm long.

Suggest **one** advantage of this adaptation to the Siberian rhinoceros.

[1 mark]

Question 6 continues on the next page

Question 06 · continued

0 6 . 5 The only parts of the Siberian rhinoceros that have been found are fossilised bones.

Give **one** reason why **only** the bones of the body of the Siberian rhinoceros became fossils.

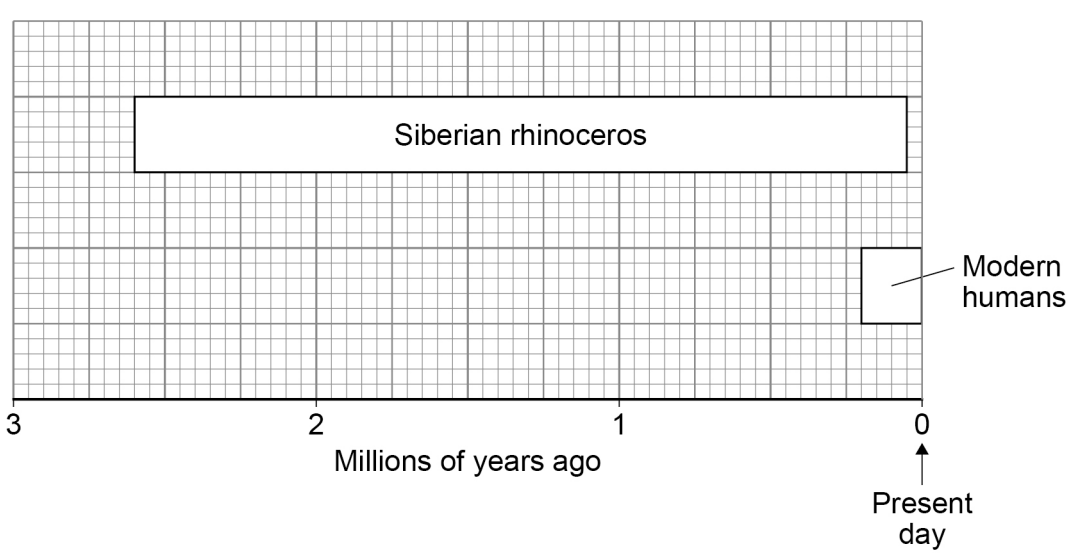
[1 mark]

0 6 . 6 Suggest how scientists can estimate when the Siberian rhinoceros was alive.

[1 mark]

Figure 9 shows when the Siberian rhinoceros existed and when modern humans existed.

Figure 9



Question 06 · continued

0 6 . 7 How many million years ago did the Siberian rhinoceros become extinct?

[1 mark]

_____ million years ago

0 6 . 8 Determine the time in years when both the Siberian rhinoceros and modern humans existed together.

Use **Figure 9** and your answer to Question **06.7**.

[3 marks]

_____

_____

_____

_____

Time = _____ years

0 6 . 9 Suggest **two** factors that may have caused the extinction of the Siberian rhinoceros.

[2 marks]

1 _____

_____

2 _____

_____

12

4.6.4 Classification of living organisms

Question 07

November 2021 | 8461/2F | Original Q5

0 5 Potato blight is a disease of potato plants.

Potato blight is caused by the fungus *Phytophthora infestans.*

0 5 . 1 What is the genus of the fungus that causes potato blight?

[1 mark]

Tick (✓) **one** box.

infestans ☐

Phytophthora ☐

Phytophthora infestans ☐

0 5 . 2 The fungus grows near the surface of the potato.

How does growing near the surface help the fungus to respire?

[1 mark]

Tick (✓) **one** box.

The fungus can get nitrogen from the soil. ☐

The fungus can get oxygen from the air. ☐

The fungus can get water from the potato. ☐

Question 5 continues on the next page

Question 07 · continued

A farmer sprays his potato plants with a pesticide.

The pesticide kills the fungus that causes potato blight.

Spraying the crop with a pesticide could decrease biodiversity in a river flowing through his farm.

0 5 . 3 What does 'biodiversity in a river' mean?

[1 mark]

Tick (✓) **one** box.

- The variety of species of animals in the river. ☐
- The variety of species of organisms in the river. ☐
- The variety of species of plants in the river. ☐

0 5 . 4 The farmer sprayed pesticide on his potato plants. The next day it rained heavily.

Explain why the biodiversity in the river decreased.

[2 marks]

Another method of preventing potato blight is to breed potatoes that are resistant to blight.

Resistance to potato blight is controlled by two alleles:

R = a dominant allele for having resistance to blight.

r = a recessive allele for **not** having resistance to blight.

A scientist crosses two potato plants. Each plant has the genotype **Rr**.

Question 07 · continued

0 5 . 5 Complete **Figure 9** to show the possible genotypes of the offspring produced.

[2 marks]

Figure 9

		Male gametes: R	Male gametes: r
Female gametes	R	RR	
Female gametes	r		

0 5 . 6 Draw a ring around **one** of the homozygous genotypes in **Figure 9**.

[1 mark]

0 5 . 7 What percentage of the offspring in **Figure 9** will be resistant to potato blight?

[1 mark]

Tick (✓) **one** box.

25% ☐ 50% ☐ 75% ☐ 100% ☐

0 5 . 8 Potatoes can also reproduce asexually.

Potatoes from one plant can be planted in the ground to produce new potato plants.

All the new plants from a parent plant that is resistant to blight will also be resistant to blight.

Explain why.

[2 marks]

11

4.6.4 Classification of living organisms

Question 08

June 2022 | 8461/2F | Original Q7

0 7 Living organisms can be classified into groups.

Trilobites are animals that lived in the sea 400 to 500 million years ago.

Table 3 gives the classification of two species of trilobite.

Table 3

Classification group	Trilobite A	Trilobite B
	Animalia	*Animalia*
Phylum	*Arthropoda*	*Arthropoda*
Class	*Trilobita*	*Trilobita*
Order	*Ptychopariida*	*Ptychopariida*
Family	*Alokistocaridae*	*Marjumiidae*
	Elrathia	*Modocia*
Species	*kingii*	*typicalis*

0 7 . 1 Complete **Table 3**.

[2 marks]

Choose answers from the box.

Community	**Genus**	**Kingdom**	**Mammal**	**Population**

4.6.4 Classification of living organisms

Question 08 · continued

0 7 . 2 Which scientist invented the classification system given in **Table 3**?

[1 mark]

Tick (✓) **one** box.

- Darwin ☐
- Lamarck ☐
- Linnaeus ☐
- Mendel ☐

0 7 . 3 What is the binomial name of trilobite **A**?

Use information from **Table 3**.

[1 mark]

Tick (✓) **one** box.

- *Arthropoda kingii* ☐
- *Elrathia kingii* ☐
- *Trilobita kingii* ☐

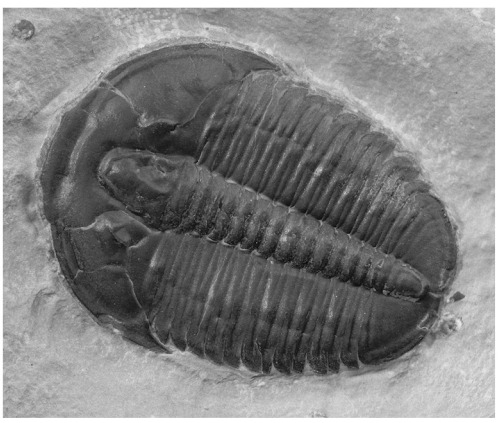
Question 7 continues on the next page

Question 08 · continued

Figure 10 shows fossils of the two species of trilobite.

Figure 10

Trilobite A



Trilobite B

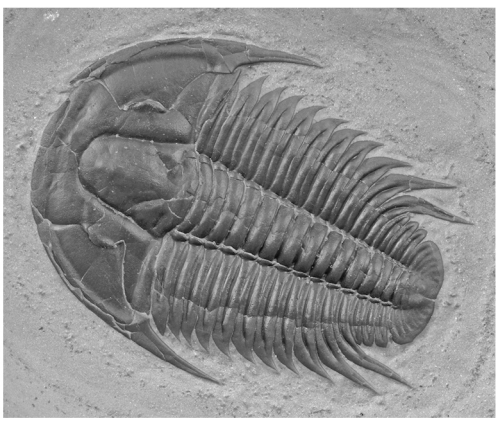
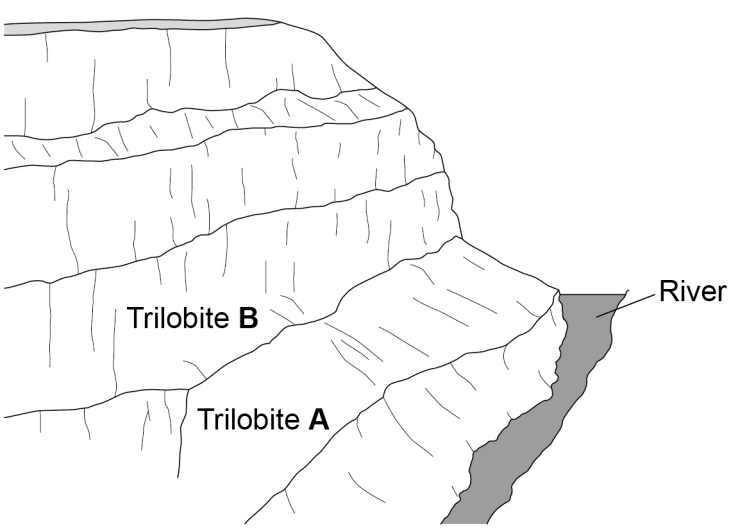


Figure 11 shows:

- layers of rock in a cliff
- where the trilobite fossils were found.

Figure 11



Question 08 · continued

A scientist made the hypothesis:

'Trilobite **B** may have evolved from trilobite **A**.'

0 7 . 4 What **two** pieces of evidence from **Figure 10** and **Figure 11** support the scientist's hypothesis?

[2 marks]

Tick (✓) **two** boxes.

Trilobite **A** and trilobite **B** were in the same type of rock. ☐

Trilobite **A** was found in older rocks than trilobite **B**. ☐

Trilobite **B** has a smaller mass than trilobite **A**. ☐

Trilobite **B** is a different colour from trilobite **A**. ☐

Trilobite **B** is more complex than trilobite **A**. ☐

0 7 . 5 Trilobites are animals that lived in the sea.

Complete the sentences about how the fossils of trilobites **A** and **B** were formed.

Choose answers from the box.

[3 marks]

acids	**bones**	**hard parts**	**minerals**
rocks	**sediments**	**soft parts**	

The animal dies and falls to the sea bed.

The animal is buried in _____.

The _____ of the animal decay.

The remains which do **not** decay are replaced by _____.

4.6.4 Classification of living organisms

Question 08 · continued

0 7 . 6 Trilobites **A** and **B** are now extinct.

Give **three** possible causes of extinction.

[3 marks]

1 _____

_____

2 _____

_____

3 _____

_____

0 7 . 7 Suggest **one** reason why scientists **cannot** be sure what caused the trilobites to become extinct.

[1 mark]

_____

_____

13

4.6.4 Classification of living organisms

Question 09

0 7 Many different species can live together in the same habitat.

0 7 . 1 What name is given to all of the organisms living in the same habitat?

[1 mark]

Tick (✓) **one** box.

- A community ☐
- A food chain ☐
- A population ☐
- An ecosystem ☐

Question 7 continues on the next page

Question 09 · continued

Figure 12 shows four species of bird from the same habitat in the UK.

Figure 12



Brambling (*Fringilla montifringilla*)



Bullfinch (*Pyrrhula pyrrhula*)



Chaffinch (*Fringilla coelebs*)



Goldfinch (*Carduelis carduelis*)

Question 09 · continued

0 7 . 2 Which species of bird in **Figure 12** do scientists think are most closely related?

[1 mark]

Tick (✓) **one** box.

- Brambling and chaffinch ☐
- Brambling and goldfinch ☐
- Bullfinch and chaffinch ☐
- Bullfinch and goldfinch ☐

0 7 . 3 Scientists think the brambling and the bullfinch belong to different species.

What evidence is used by scientists to classify the brambling and the bullfinch as different species?

[1 mark]

Tick (✓) **one** box.

- The brambling and the bullfinch are different sizes. ☐
- The brambling and the bullfinch cannot breed together to give fertile offspring. ☐
- The brambling and the bullfinch live in different parts of the habitat. ☐
- The brambling eats mainly seeds and the bullfinch eats mainly insects. ☐

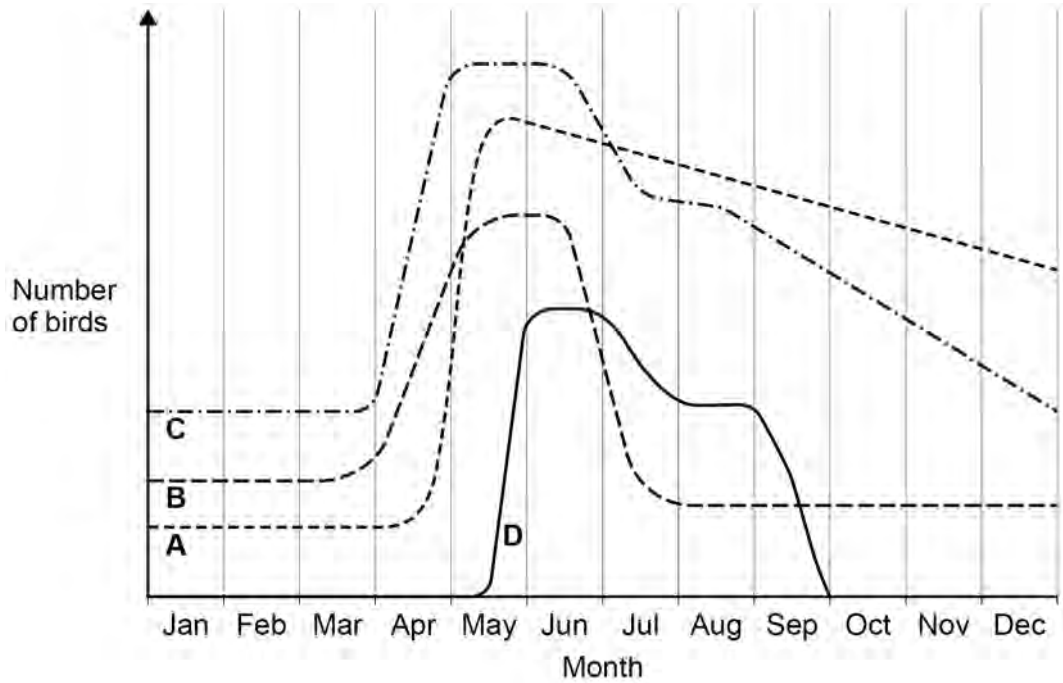
Question 7 continues on the next page

Question 09 · continued

Four other species of bird (**A**, **B**, **C** and **D**) live in a habitat in the UK.

Figure 13 shows how the numbers of each species of bird varied during one year.

Figure 13



Use information from **Figure 13** to answer Questions **07.4** to **07.6**

0 7 . 4 Describe what happens to the number of birds of species **A** during the year.

[3 marks]

4.6.4 Classification of living organisms

Question 09 · continued

0 7 . 5 In June and July, a disease affected the populations of some of the species.

Which species had the **lowest** resistance to the disease?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

0 7 . 6 One species migrates between the UK and other countries.

Which species migrates between the UK and other countries?

Give a reason for your answer.

[1 mark]

Species _____

Reason _____

_____

_____

8

4.6.4 Classification of living organisms

Question 10

June 2024 | 8461/2F | Original Q2

0 2 Carl Linnaeus invented a classification system that places organisms into groups.

0 2 . 1 What is the name of the largest classification group in Linnaeus's system?

[1 mark]

Tick (✓) **one** box.

- Family ☐
- Kingdom ☐
- Order ☐

0 2 . 2 Linnaeus gave each species a binomial name.

Which **two** classification groups form the binomial name?

[2 marks]

Tick (✓) **two** boxes.

- Class ☐
- Genus ☐
- Order ☐
- Phylum ☐
- Species ☐

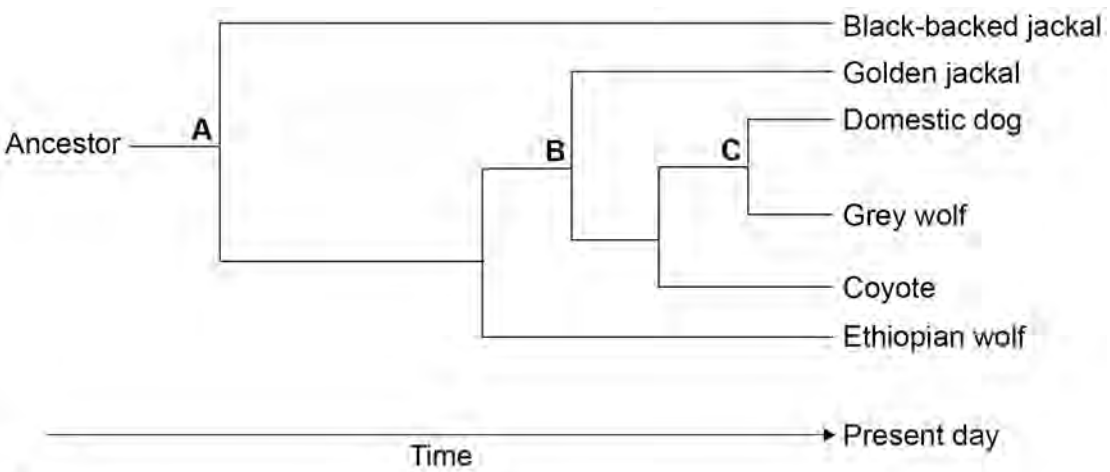
Question 2 continues on the next page

Question 10 · continued

Scientists think that the animals in **Figure 2** all evolved from an ancestor that lived about 6 million years ago.

Figure 2 shows how the animals may have evolved.

Figure 2



Key

A 6 million years ago
B 3 million years ago
C 32 thousand years ago

0 2 . 3 What was the **most recent** time that the domestic dog and the golden jackal shared a common ancestor?

[1 mark]

Tick (✓) **one** box.

- 32 thousand years ago ☐
- 3 million years ago ☐
- 6 million years ago ☐

4.6.4 Classification of living organisms

Question 10 · continued

0 2 . 4 Which present-day animal in **Figure 2** is the **most distant** relative of the domestic dog?

[1 mark]

Question 2 continues on the next page

4.6.4 Classification of living organisms

Question 10 · continued

Scientists think the grey wolf and the domestic dog had a common ancestor.

The common ancestor:

- lived about 32 thousand years ago
- is now extinct.

0 2 . 5 Give **two** possible causes of extinction.

[2 marks]

1 _____

_____

2 _____

_____

0 2 . 6 32 thousand years ago, humans hunted other animals for food.

Wolves also hunted other animals for food.

Suggest **one** reason why wolves began to follow groups of humans.

[1 mark]

_____

_____

0 2 . 7 Some wolves are more aggressive than other wolves.

Describe how selective breeding of wolves could produce a domestic animal that is less aggressive than the wolf.

[2 marks]

_____

_____

_____

_____

10

4.6.4 Classification of living organisms

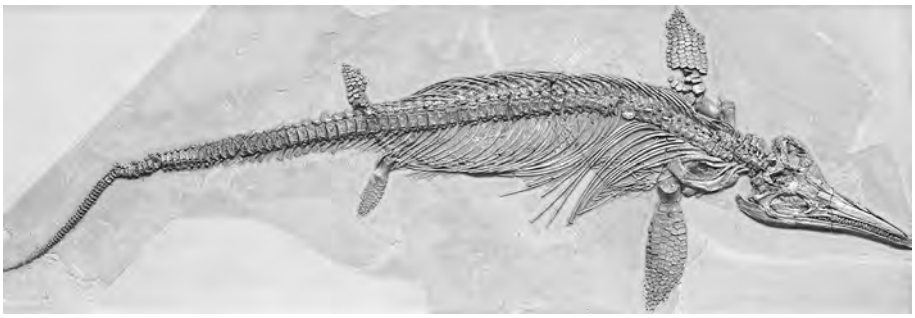
Question 11

June 2025 | 8461/2F | Original Q8

0 8 Ichthyosaurs are reptiles that lived in the sea millions of years ago.

Figure 13 shows the fossilised remains of an ichthyosaur.

Figure 13



0 8 . 1 Suggest how the fossil in **Figure 13** was formed after the ichthyosaur died.

[2 marks]

0 8 . 2 The length of the image of the ichthyosaur in **Figure 13** is 120 mm.

The real length of the ichthyosaur was 17 times longer than the image in **Figure 13**.

Calculate the real length of the ichthyosaur.

Give your answer in metres.

[3 marks]

Real length of ichthyosaur = _____ metres

Question 11 · continued

0 8 . 3 **Table 5** gives the classification of the ichthyosaur in **Figure 13**.

Table 5

Classification group	Name
Kingdom	Animalia
	Chordata
Class	Reptilia
Order	Ichthyosauria
	Ichthyosauridae
Genus	Ichthyosaurus
Species	intermedius

Complete **Table 5**.

[2 marks]

Choose answers from the box.

Community	Family	Mammal	Phylum	Population

0 8 . 4 Ichthyosaurs were predators.

Ichthyosaurs are now extinct.

Scientists think that extinction of the ichthyosaurs was caused by increased competition with other predators for food.

Suggest **two other** possible causes of extinction of the ichthyosaurs.

[2 marks]

1 _____

_____

2 _____

_____

9