AQA GCSE Biology | 8461

SPECIFICATION POINT 4.6.2.2

Evolution

Past-paper questions

Tier	**Foundation**
Question groups	**48**
Available paper years	**2007–2024**

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.

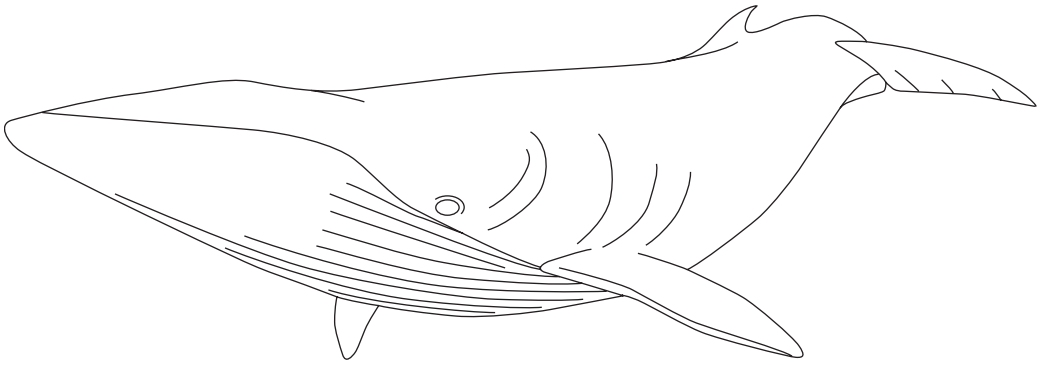
4.6.2.2 Evolution

Question 01

January 2007 | BLY1F | Original Q1 | Legacy

1 (a) **Figure 1** shows a minke whale. Whales live in the sea.

Figure 1



Write down **two** ways in which the body of the whale is adapted for swimming.

1 .....

.....

2 .....

.....

(2 marks)

(b) **Figure 2** shows the skeleton of a minke whale.

Figure 2

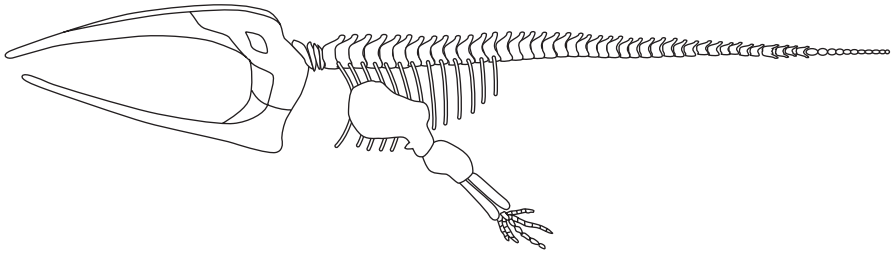
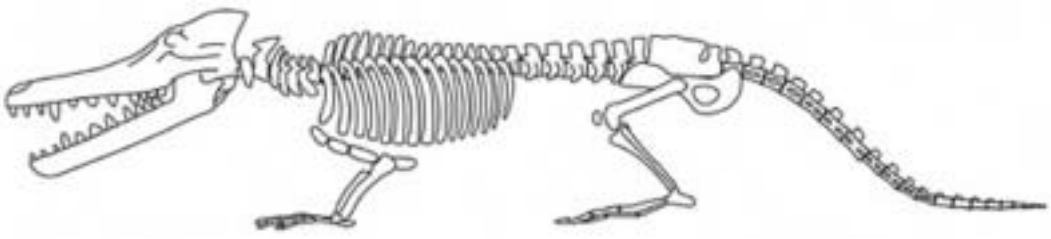


Figure 3 shows the fossil skeleton of an extinct whale.

Figure 3



4.6.2.2 Evolution

Question 01 · continued

BLANK

(i) Apart from size, give **two** differences between the skeleton of the minke whale and the fossil skeleton of the extinct whale.

1 .....

.....

2 .....

.....

(2 marks)

(ii) In each of the sentences below, draw a ring around the correct answer.

Life on Earth first developed more than three [billion / million / thousand] years ago.

Fossils [disprove / give evidence for / prove] the theory of evolution.

(2 marks)

6

4.6.2.2 Evolution

Question 02

March 2007 | BLY1A | Original Q6 | Legacy

QUESTION SIX

Avian influenza (bird flu) is caused by a virus which was first identified in 1900. Recently there have been concerns that new strains of the virus may be able to infect humans.

Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A antibiotics

B natural selection

C pandemic

D resistance

Avian influenza cannot be treated with . . . **1** . . . .

The influenza virus may develop . . . **2** . . . to the drugs used as a result of . . . **3** . . . .

This may cause a . . . **4** . . . of the disease.

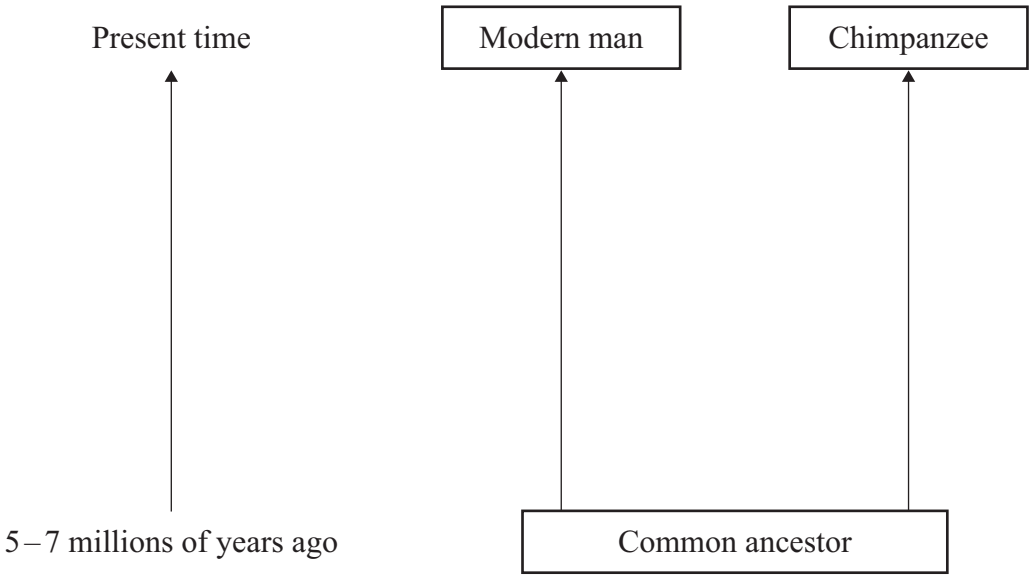
4.6.2.2 Evolution

Question 03

March 2007 | BLY1B | Original Q4 | Legacy

QUESTION FOUR

The diagram shows part of the pathway of human evolution from a common ancestor to modern man (Homo sapiens).



Match words, **A**, **B**, **C** and **D**, with the numbers **1 – 4** in the sentences.

A evolved

B genes

C natural selection

D survived

Modern man and chimpanzees . . . **1** . . . from a common ancestor as a result of . . . **2** . . . .

Differences in the . . . **3** . . . of different individuals meant that some . . . **4** . . . to breed more successfully than others.

4.6.2.2 Evolution

Question 04

June 2007 | BLY1B | Original Q8 | Legacy

QUESTION EIGHT

One theory of evolution states that all different species of living organisms alive today have evolved from much simpler life forms. These simpler life forms first appeared more than three billion years ago.

The remains of extinct animals and plants may form fossils that can be found in rocks.

Fossils are studied to find out how present-day species have changed from earlier species.

8A The presence of fossils supports the theory of evolution because . . .

1 fossil organisms are found in different layers of rocks.

2 fossil organisms have features in common with present-day organisms.

3 present-day organisms have evolved from fossil organisms.

4 adaptation to the environment by fossil organisms caused the development of new species.

8B Which of the following is **not** a cause of extinction?

1 changes in the environment

2 mutation

3 new diseases

4 new predators

8C Darwin's theory of evolution via natural selection was only gradually accepted because . . .

1 books were expensive.

2 Darwin was not a scientist.

3 Lamark had a better theory.

4 the causes of variation were not known at that time.

4.6.2.2 Evolution

8D Scientists are uncertain about the origin of life on Earth because . . .

1 fossils last for only a few million years.

2 humans evolved later than most other organisms.

3 new competitors caused the extinction of the earliest organisms.

4 the earliest organisms had soft bodies.

Turn over for the next question

4.6.2.2 Evolution

Question 05

November 2007 | BLY1B | Original Q8 | Legacy

QUESTION EIGHT

Rabbits and hares are closely related species.

They are thought to have descended from a common ancestor that is now extinct.

8A Extinction may be caused by . . .

1 an increase in variation.

2 a lack of new competitors.

3 fossilisation.

4 changes in the environment.

8B The evidence that rabbits and hares have evolved from a common ancestor would be shown by . . .

1 comparing modern rabbits and hares with other related species.

2 studying the fossil record of rabbits and hares.

3 studying the fossils of predators of rabbits and hares.

4 comparing the behaviour of rabbits and hares.

8C Rabbits and hares both feed on plants and have teeth adapted for this.

Which one of the following is **not** a possible factor for the development of the specialised teeth of rabbits and hares?

1 adaptation to the environment

2 changes in the environment

3 evolution of predators

4 natural selection

8D What is a mutation?

1 a change in the physical appearance of an organism

2 a change in a gene

3 a form of natural selection

4 a change in the environment

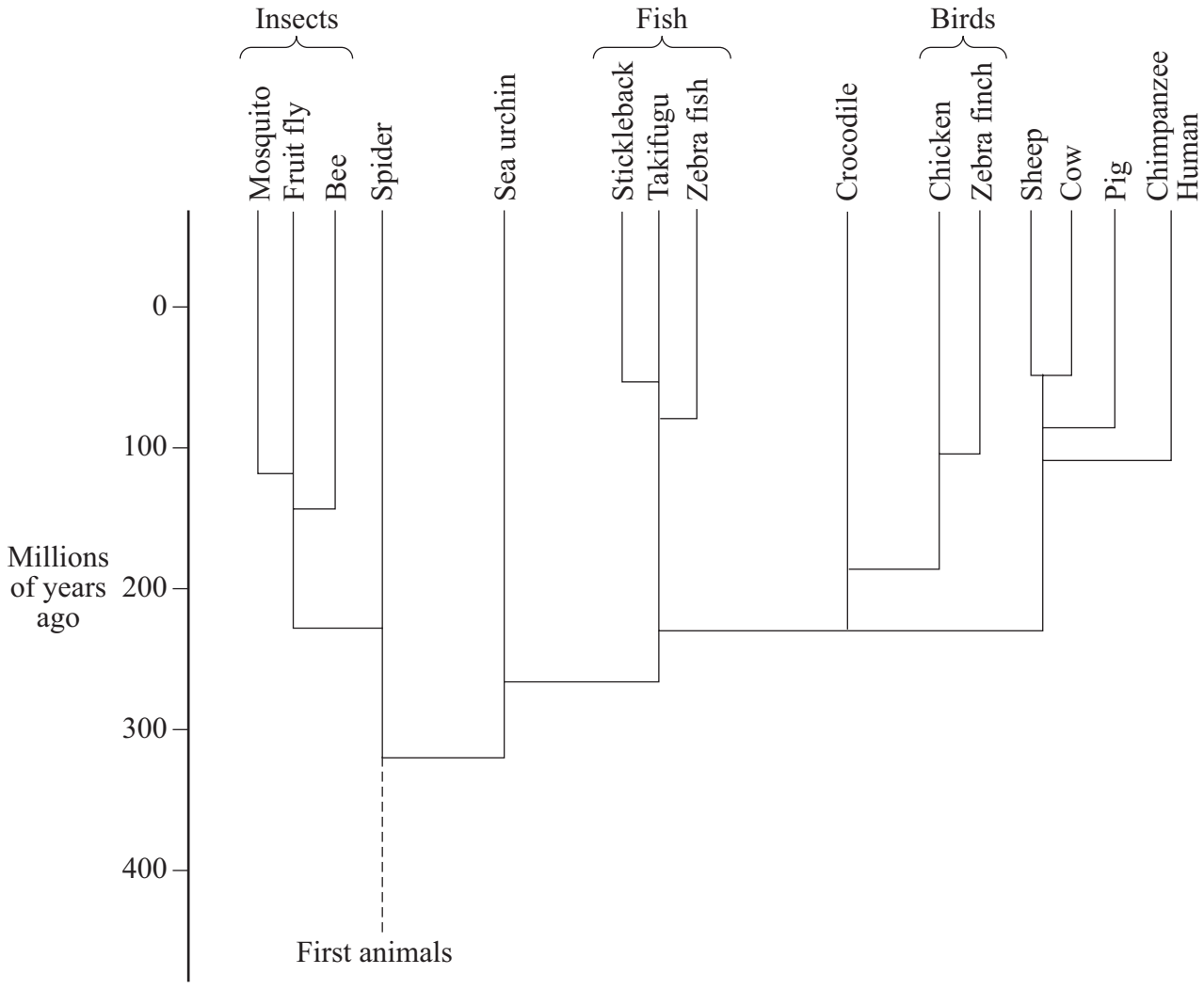
4.6.2.2 Evolution

Question 06

March 2008 | BLY1BP | Original Q4 | Legacy

QUESTION FOUR

The diagram shows how and when some different types of animal are thought to have evolved.



Match animals, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A sheep

B insects

C sea urchins

D crocodiles

Cows and . . . **1** . . . are more closely related than cows and pigs.

Around 230 million years ago, the first . . . **2** . . . began to evolve.

The first fish, such as Takifugu, may have evolved from the ancestors of . . . **3** . . . .

Birds could have evolved from the ancestors of . . . **4** . . . .

4.6.2.2 Evolution

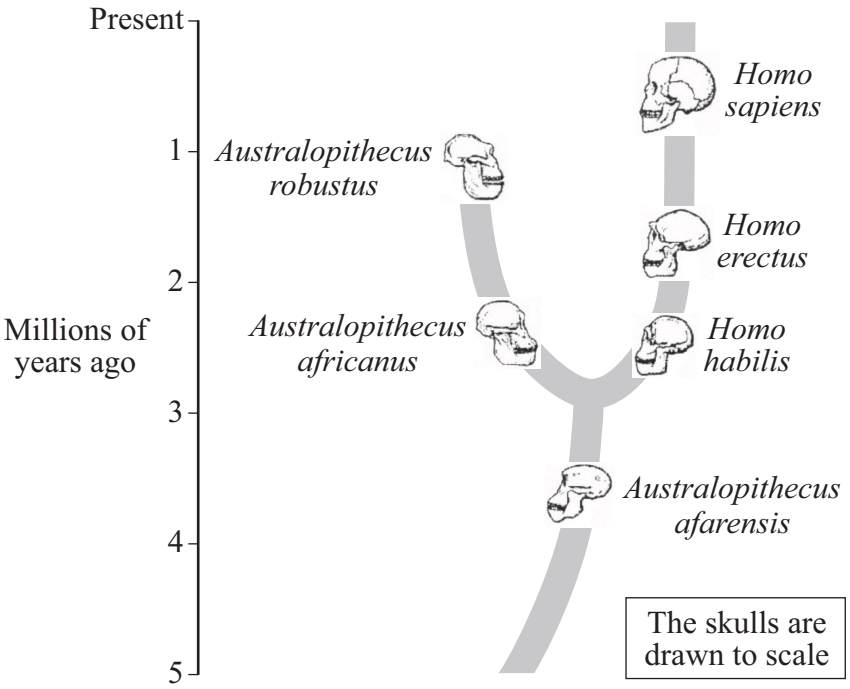
Question 07

June 2008 | BLY1BP | Original Q4 | Legacy

QUESTION FOUR

The diagram shows a possible evolutionary tree for humans (*Homo sapiens*).

All the organisms except *Homo sapiens* are extinct.



Match names, **A**, **B**, **C** and **D**, with the numbers **1–4** in the table.

A *Homo sapiens*

B *Australopithecus robustus*

C *Australopithecus afarensis*

D *Homo habilis*

1	the first organism to evolve
2	the direct ancestor of modern humans that evolved $2\frac{1}{2}$ million years ago
3	the organism with the largest brain
4	the organism that became extinct most recently

4.6.2.2 Evolution

Question 08

June 2008 | BLY1BP | Original Q5 | Legacy

QUESTION FIVE

This question is about evolution.

Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the table.

A extinction

B natural selection

C mutation

D variation

1	a theory put forward by Darwin
2	differences shown by individuals in the same species
3	a change in a gene
4	may be caused by new predators

4.6.2.2 Evolution

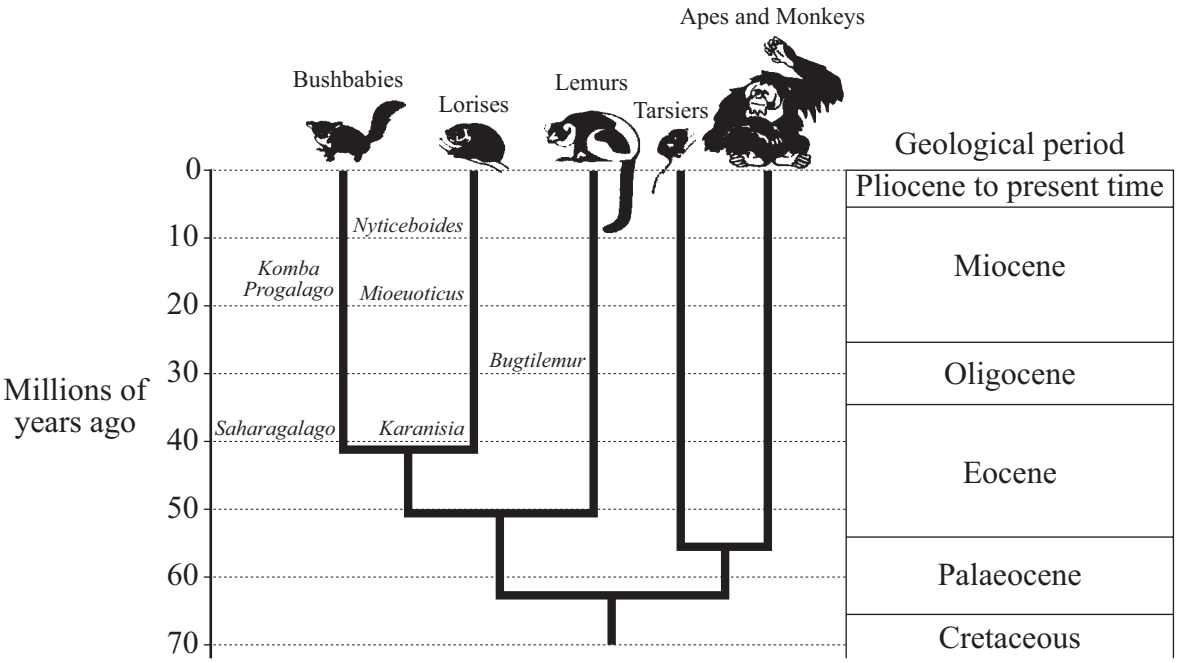
Question 09

June 2008 | BLY1F | Original Q4 | Legacy

4 The diagram shows an evolutionary tree for a group of animals called primates.

The names of extinct animals are printed in italics e.g. *Nycticeboides*.

The drawings show animals that are alive today.



4 (a) (i) How many million years ago did *Karanisia* first appear?

..... millions of years ago.

(1 mark)

4 (a) (ii) During which geological period did the Apes and Monkeys begin to evolve?

.....

(1 mark)

4 (a) (iii) Which group of primates alive today are the closest relatives of the Lorises?

.....

(1 mark)

4.6.2.2 Evolution

Question 09 · continued

for mark

4 (b) Darwin was the first scientist to state that humans and other primates had common ancestors.

Many people were against Darwin's ideas at that time.

Give **two** reasons why they were against his ideas.

1 .....

.....

2 .....

.....

(2 marks)

5

Turn over for the next question

4.6.2.2 Evolution

Question 10

November 2008 | BLY1BP | Original Q5 | Legacy

QUESTION FIVE

This question is about Darwin's and Lamarck's theories of evolution.

Match statements, **A**, **B**, **C** and **D**, with the numbers **1–4** in the table.

A observed that all species change over time

B had sufficient evidence to prove evolution

C thought that natural selection operated on variations present at birth

D thought that the changes that happen during an organism's lifetime are inherited by their offspring

1	only Darwin
2	only Lamarck
3	Darwin and Lamarck
4	neither Darwin nor Lamarck

4.6.2.2 Evolution

Question 11

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.

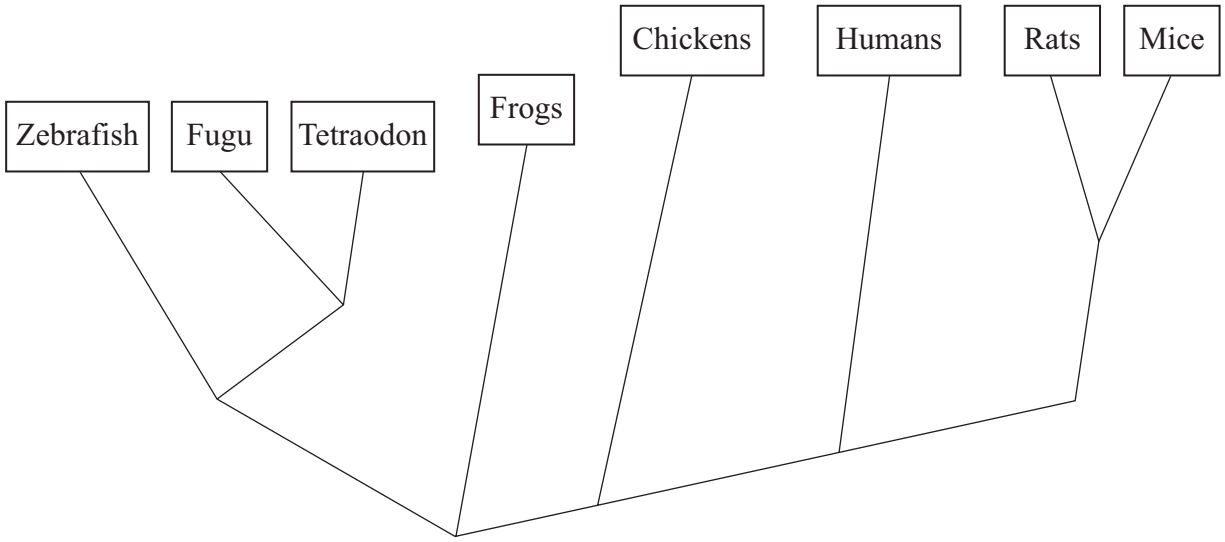
3 about 10 billion years ago.

4 about 30 billion years ago.

4.6.2.2 Evolution

Question 11 · 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.

4.6.2.2 Evolution

Question 12

4 Animals have adaptations that enable them to survive.

4 (a) The photograph shows an echidna.



© Noeline Kelly/Corbis

The echidna has pointed spines on its back.

Explain how these spines might help the echidna to survive.

.....

.....

.....

.....

.....

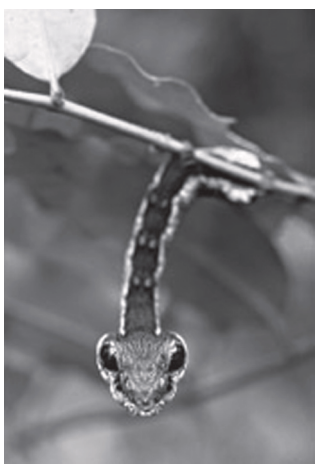
(2 marks)

Question 4 continues on the next page

Question 12 · continued

for mark

4 (b) The photograph shows a caterpillar.



© S.J. Krasemann / Peter Arnold / Still Pictures

Explain how the caterpillar's appearance might help it to survive.

.....

.....

.....

.....

.....

(2 marks)

4.6.2.2 Evolution

Question 12 · continued

for mark

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

4 (c) (i) Evolution can be explained by a theory called

genetic engineering
mutation
natural selection

.

(1 mark)

4 (c) (ii) This theory was suggested by a scientist called Charles

Darwin
Lamarck
Semmelweiss

.

(1 mark)

4 (c) (iii) This scientist said that all living things have evolved from

monkeys
dinosaurs
simple life forms

.

(1 mark)

4 (d) Many religious people oppose the theory of evolution.

Give **one** reason why.

.....

.....

(1 mark)

8

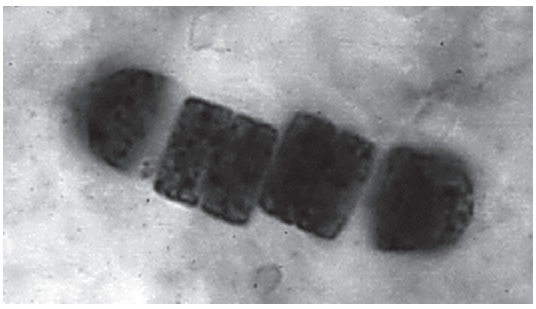
4.6.2.2 Evolution

Question 13

March 2009 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

The photograph shows a fossil which was formed 3 billion years ago.



J.W. Schopf, University of California, *www.ucmp.berkeley.edu*

6A There were probably other types of organism in the area when this fossil was being formed.

Why did these other organisms **not** become fossils?

1 They could move very quickly.

2 They had soft bodies.

3 They evolved.

4 They became extinct.

6B Only a few rocks contain fossils that are more than 3 billion years old.

This is because . . .

1 many fossils have been destroyed.

2 fossils only last for 3 billion years.

3 most of the Earth's rocks are under the oceans.

4 the Earth was created 3 billion years ago.

4.6.2.2 Evolution

6C The species that formed this fossil could have died out because . . .

1 it had no method of reproduction.

2 it was crushed by rocks.

3 its ancestors had not become fossils.

4 its environment changed.

6D The theory of evolution states that all living things . . .

1 have evolved from simple life forms.

2 will become extinct.

3 are genetically different.

4 evolved from apes.

Turn over for the next question

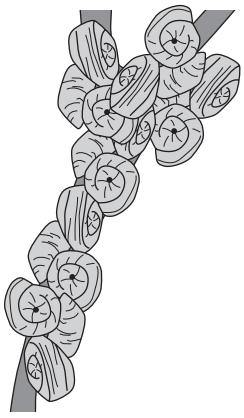
4.6.2.2 Evolution

Question 14

June 2009 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

Banded snails live in woodland and grassland.



Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A evolution

B mutation

C selection

D variation

Banded snails have a wide range of different colours on their shells.

This wide range of colours is an example of . . . **1** . . . .

A change in a gene that gives a different colour is caused by . . . **2** . . . .

Birds only eat certain coloured snails. This is an example of . . . **3** . . . .

Over a long period of time, new species of snails develop. This is an example of . . . **4** . . . .

4.6.2.2 Evolution

Question 15

November 2009 | BLY1BP | Original Q4 | Legacy

QUESTION FOUR

Organisms have changed since life began on Earth.

Match terms, **A**, **B**, **C** and **D**, with the descriptions **1–4** in the table.

A evolution

B extinction

C natural selection

D reproduction

1	the theory that all living species developed from simple life forms over billions of years
2	genes being passed on from one generation to the next
3	a species dying out
4	organisms that are most suited to their environment survive to breed

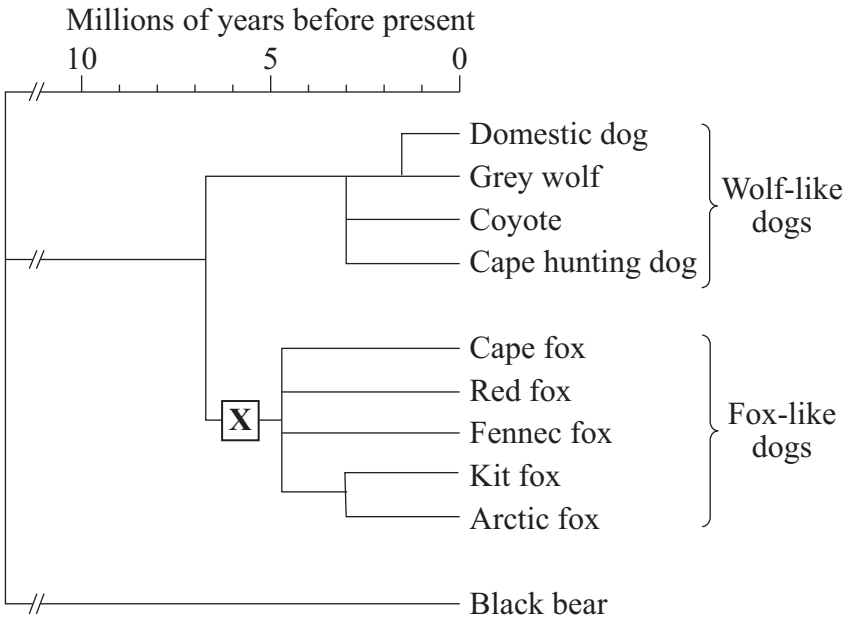
4.6.2.2 Evolution

Question 16

November 2009 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

The evolutionary tree shows how different species of dog have evolved.



6A How many million years ago did the domestic dog become a separate species?

1 1.6

2 3.9

3 6.8

4 10

4.6.2.2 Evolution

Question 16 · continued

6B Which animal is most closely related to the Arctic Fox?

1 Black bear

2 Kit fox

3 Cape fox

4 Fennec fox

6C The letter **X** in the diagram refers to . . .

1 an extinct animal that had characteristics similar to those of the fox-like dogs.

2 a living animal that is a cross between a fox and a dog.

3 an extinct animal with characteristics similar to a domestic dog.

4 an endangered species.

6D One reason why Darwin's theory of evolution was only gradually accepted was that . . .

1 natural selection had not been discovered.

2 there were no fossils.

3 it went against the idea that God made all of the animals and plants.

4 Darwin had no evidence for evolution.

4.6.2.2 Evolution

Question 17

January 2010 | BLY1F | Original Q6 | Legacy

6 Charles Darwin proposed the theory of natural selection.

6 (a) What is meant by natural selection?

.....

.....

.....

.....

(2 marks)

6 (b) The drawings show stages in the evolution of the human skeleton.

All the drawings are to the same scale.



Ape-like ancestor ⟶ Modern human

Use information from the drawings to describe **two** trends in the evolution of the human skeleton.

1 .....

.....

2 .....

.....

(2 marks)

4.6.2.2 Evolution

Question 17 · continued

for mark

6 (c) Darwin said that humans had evolved from ape-like ancestors.
Many people disagreed with him at the time.

Give **two** reasons why.

1 .....

.....

2 .....

.....

(2 marks)

6 (d) Lamarck's theory of evolution stated that useful changes which occur in an organism during its lifetime will be inherited by its offspring.

Give **one** way in which Darwin's theory differs from Lamarck's.

.....

.....

(1 mark)

7

4.6.2.2 Evolution

Question 18

March 2010 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

Evolution may result in entirely new species over a period of time.

6A Simple life forms first evolved about . . .

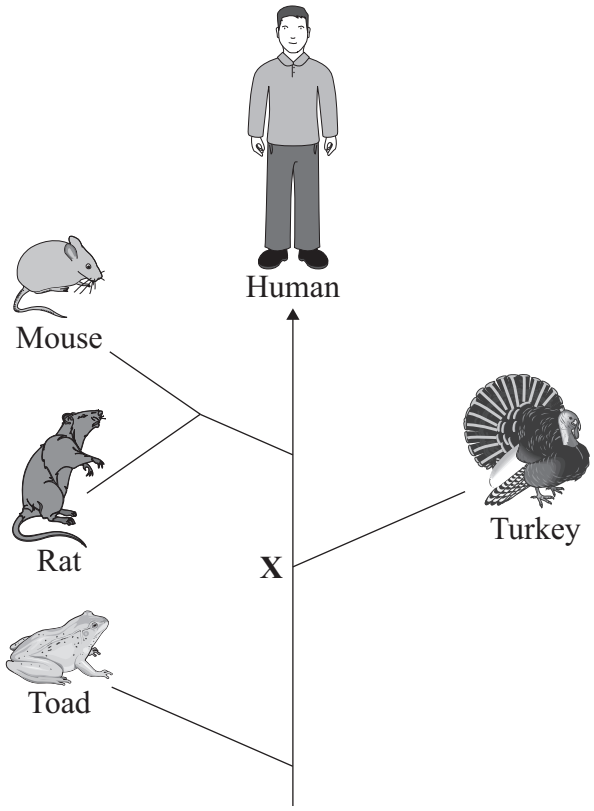
1 3 hundred years ago.

2 3 thousand years ago.

3 3 million years ago.

4 3 billion years ago.

The diagram shows an evolutionary tree.



4.6.2.2 Evolution

Question 18 · continued March 2010 | BLY1BP | Original Q6 | Legacy

6B The differences between the rat and the mouse are due to differences in their . . .

1 genes.

2 environment.

3 survival.

4 food.

6C The point labelled **X** represents a common ancestor for . . .

1 turkey, human, mouse and rat.

2 toad, turkey, rat and mouse.

3 toad, human, rat and mouse.

4 turkey, toad, human and rat.

6D The two animals on this diagram that are most closely related are the . . .

1 mouse and rat.

2 turkey and toad.

3 human and mouse.

4 rat and turkey.

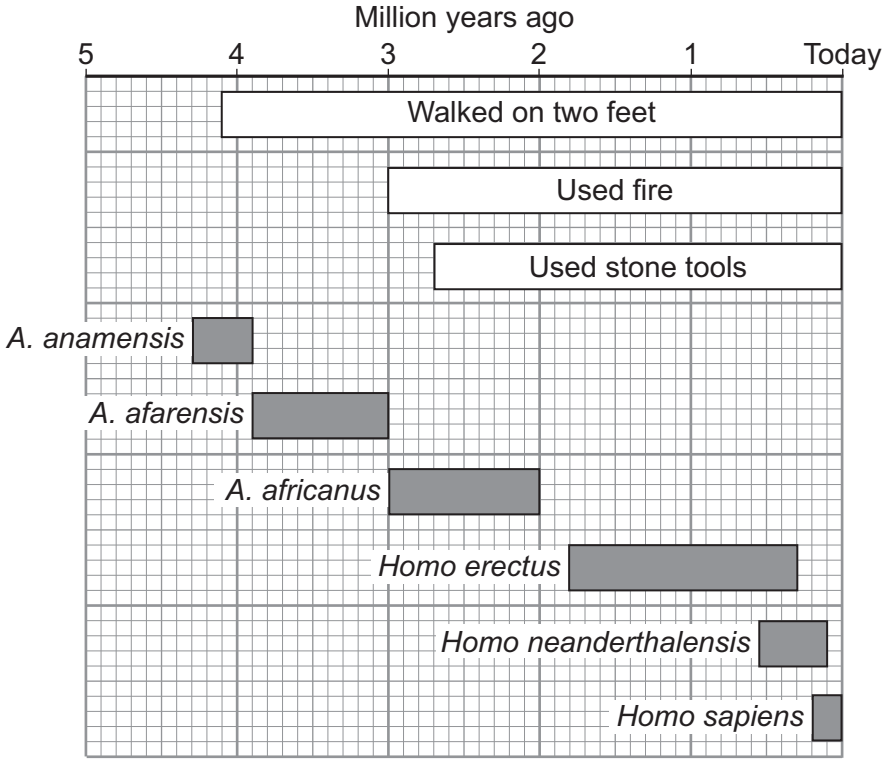
4.6.2.2 Evolution

Question 19

June 2010 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

The diagram shows a timeline for the evolution of humans.



Match names, **A**, **B**, **C** and **D**, with the statements **1–4** in the table.

A *A. anamensis*

B *A. africanus*

C *Homo erectus*

D *Homo sapiens*

1	is still alive today
2	survived for the longest time
3	first human to walk on two feet
4	first human to walk on two feet, to use fire and to use stone tools

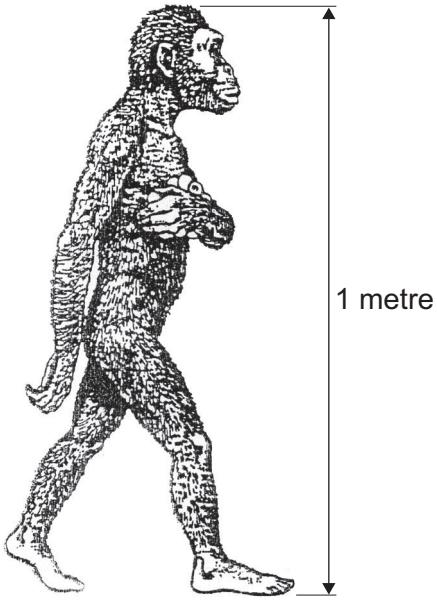
4.6.2.2 Evolution

Question 20

June 2010 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

The drawing shows what we think an extinct human-like animal looked like. The animal has been nicknamed 'Lucy'.



6A There are many differences between Lucy and modern humans.

One difference is that modern humans have . . .

1 shorter legs.

2 a more upright posture.

3 a more protruding jaw.

4 less body hair.

4.6.2.2 Evolution

Question 20 · continued June 2010 | BLY1BP | Original Q6 | Legacy

6B What caused the differences between Lucy and modern humans?

1 temperature increases in the environment

2 mutations in the genes

3 new diseases

4 competition with each other for food

6C Scientists have found evidence for the existence of Lucy by . . .

1 doing genetic engineering.

2 extracting DNA from apes.

3 watching modern apes.

4 studying fossils.

6D Darwin's theory of evolution states that all species of living things have evolved from simple life forms.

It took a long time for Darwin's theory of evolution to be widely accepted because . . .

1 books were expensive.

2 Darwin was not a scientist.

3 Lamarck had a better theory.

4 the causes of variation were not known at that time.

4.6.2.2 Evolution

Question 21

June 2010 | BLY1F | Original Q7 | Legacy

7 The photograph shows an *Anolis* lizard. This lizard lives on a tiny island.



Scientists investigated how the leg length of the *Anolis* lizards affected their survival. At the start of the investigation the *Anolis* lizards had a large range of leg lengths.

- The scientists placed six *Curly-tailed* lizards onto the island.
- The *Curly-tail* lizard is a predator of the *Anolis* lizard.
- After one year the population of *Anolis* lizards had halved.
- Nearly all the remaining *Anolis* lizards had long legs.

7 (a) Why did the population of *Anolis* lizards halve?

.....

.....

(1 mark)

7 (b) The remaining *Anolis* lizards had long legs.

Suggest an explanation for this.

.....

.....

.....

.....

.....

(2 marks)

4.6.2.2 Evolution

Question 21 · continued

7 (c) Answer each of these questions by placing a tick (✓) in the correct box.

7 (c) (i) Which theory is supported by evidence from this investigation?

Global warming	☐
Natural selection	☐
Sustainability	☐

(1 mark)

7 (c) (ii) Which scientist proposed this theory?

Darwin	☐
Lamarck	☐
Semmelweiss	☐

(1 mark)

5

4.6.2.2 Evolution

Question 22

November 2010 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

Living things have evolved on Earth over billions of years.

Match words, **A**, **B**, **C** and **D**, with the statements **1–4** in the table.

A extinction

B mutation

C natural selection

D variation

1	a sudden change in a gene or chromosome
2	the range of differences in the characteristics of a species
3	the survival of organisms best suited to the environment
4	the death of all organisms of a species

4.6.2.2 Evolution

Question 23

November 2010 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

This question is about evolution.

6A Approximately how long ago did the first simple life-forms appear on Earth?

1 300 000 years

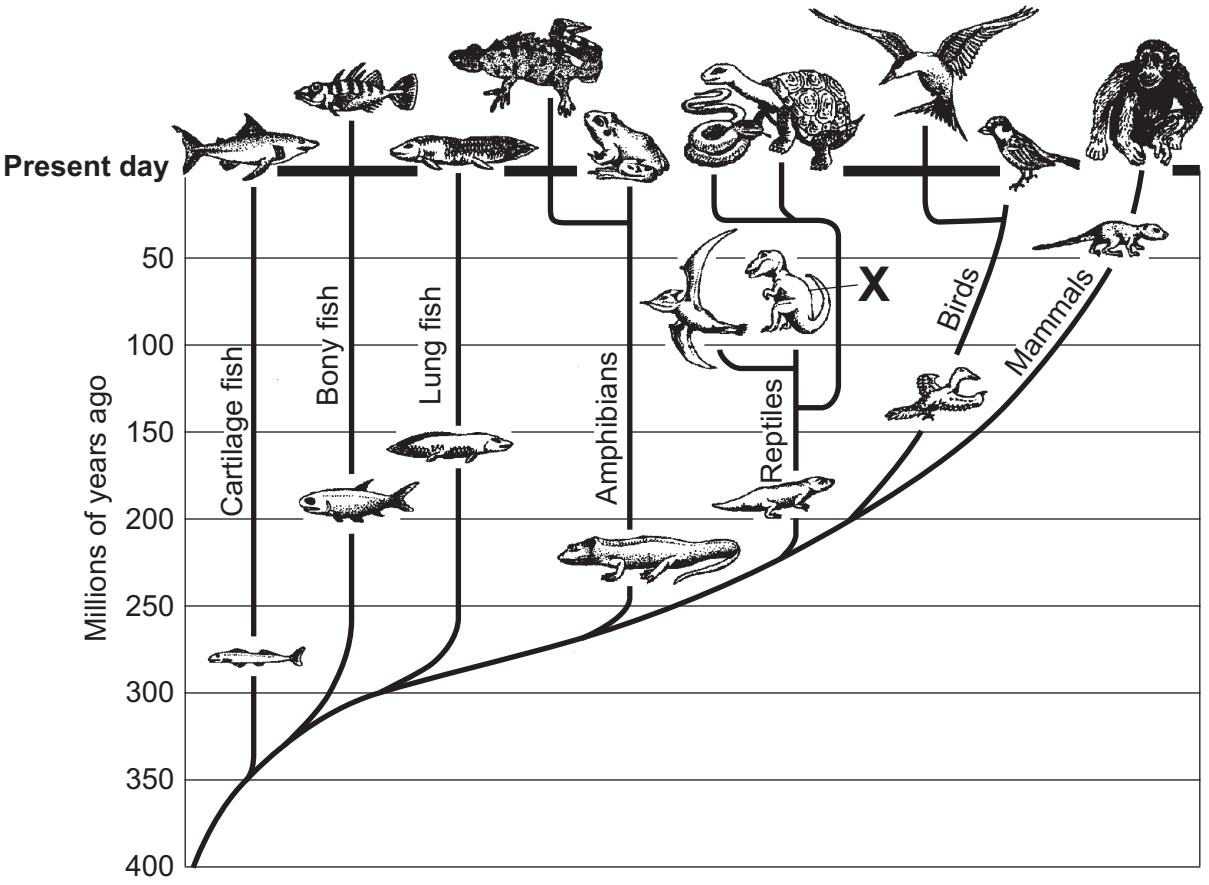
2 3 million years

3 300 million years

4 3 billion years

The diagram shows an evolutionary tree for some groups of animals.

All the species below the line for present day are extinct.



4.6.2.2 Evolution

Question 23 · continued

6B Which group of animals shown on the diagram evolved first?

1 mammals

2 birds

3 reptiles

4 cartilage fish

6C Which two groups of animals evolved at nearly the same time?

1 cartilage fish and bony fish

2 reptiles and birds

3 mammals and birds

4 reptiles and amphibians

6D The animal labelled **X** has been extinct for over 50 million years.

How do we know that animal **X** once lived?

1 Drawings of the animal were made when the animal was alive.

2 Fossils of the animal have been found in rocks.

3 People were alive to see the animal.

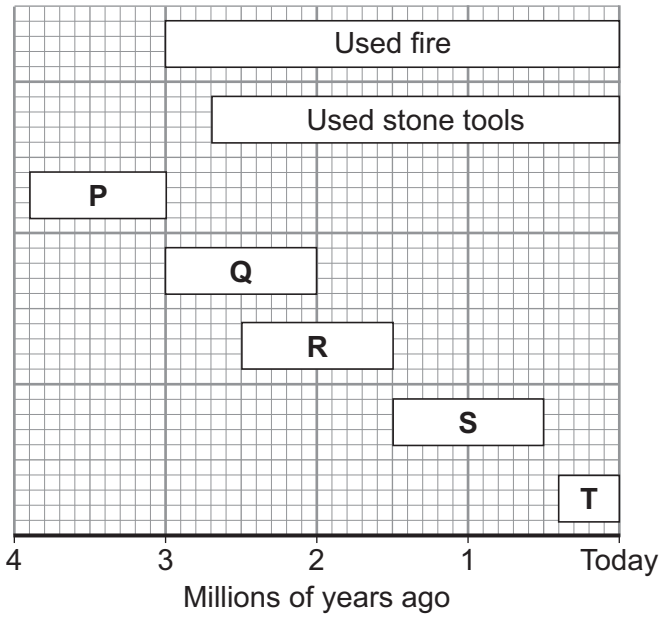
4 Reptiles are alive today.

4.6.2.2 Evolution

Question 24

January 2011 | BLY1F | Original Q2 | Legacy

2 The diagram shows a time line for the evolution of humans.



The letters **P**, **Q**, **R** and **S** show human ancestors.
The letter **T** shows modern humans.

2 (a) (i) How many millions of years ago did humans first use fire? ☐ millions of years ago

(1 mark)

2 (a) (ii) Which human ancestor, **P**, **Q**, **R** or **S**, was the first ancestor to use tools? ☐

(1 mark)

2 (a) (iii) For how many millions of years did human ancestor **R** live on Earth? ☐

(1 mark)

2 (b) How do we know that human ancestors **P**, **Q**, **R** and **S** lived on Earth?

.....

.....

(1 mark)

4.6.2.2 Evolution

Question 24 · continued

2 (c) Which scientist suggested that humans have evolved from ape-like ancestors?

Draw a ring around **one** answer.

Darwin **Mendel** **Semmelweiss**

(1 mark)

5

Turn over for the next question

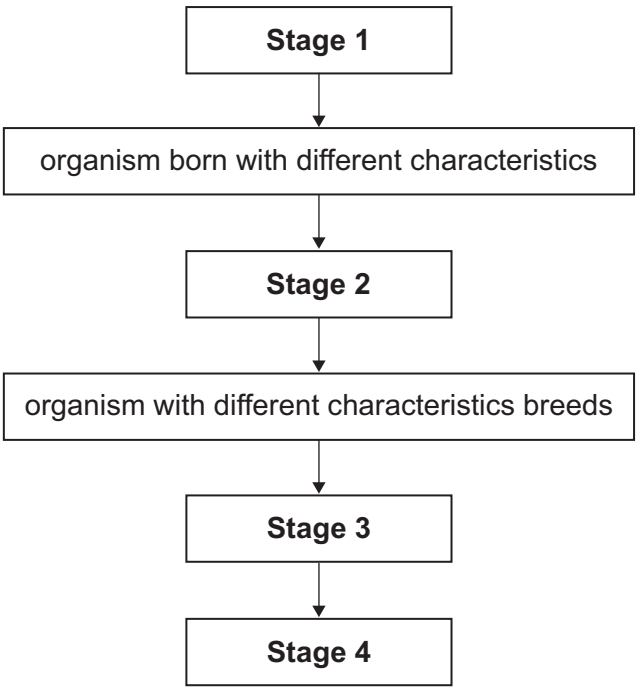
4.6.2.2 Evolution

Question 25

March 2011 | BLY1BP | Original Q4 | Legacy

QUESTION FOUR

The diagram shows a flow chart for evolution.



Match stages of evolution, **A**, **B**, **C** and **D**, with the stages **1**–**4** in the flow chart.

A the organism is now a better competitor

B the mutated gene is passed on to offspring

C a gene mutates

D a new species is produced

4.6.2.2 Evolution

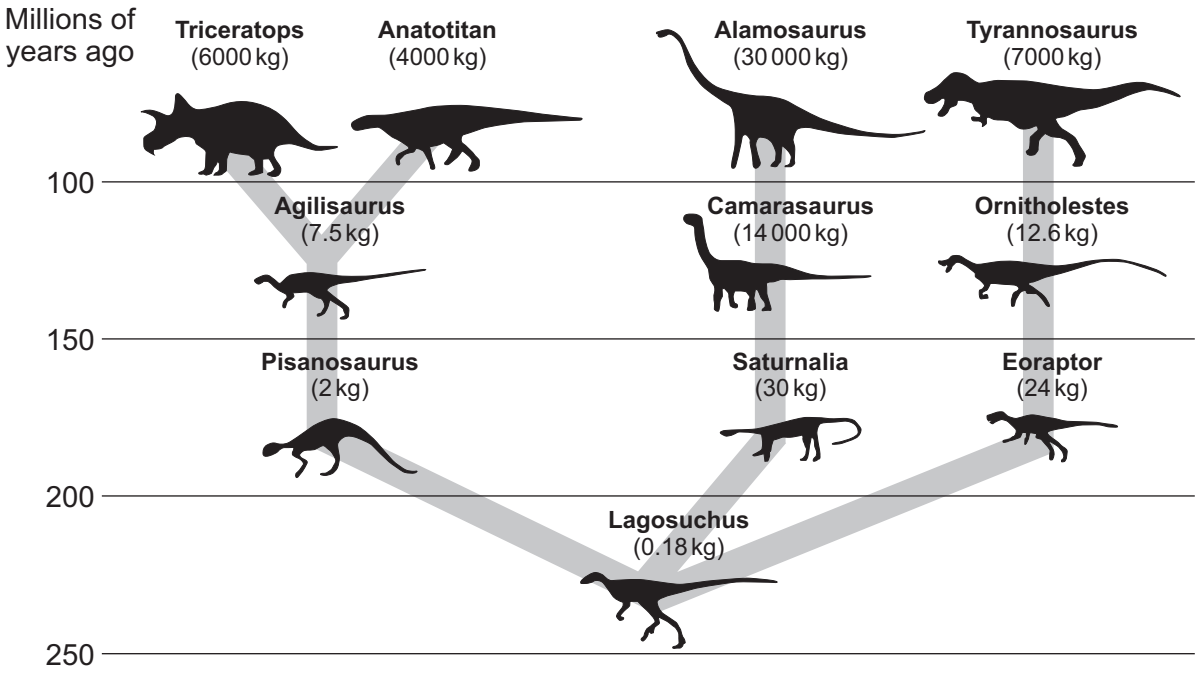
Question 26

June 2011 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

The diagram shows a timeline for the evolution of some dinosaurs.

The average mass of each dinosaur is shown in brackets under its name.



Match dinosaurs, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

A Alamosaurus

B Lagosuchus

C Saturnalia

D Triceratops

1	the dinosaur that lived the longest time ago
2	the dinosaur that evolved from Agilisaurus
3	the dinosaur from which Camarasaurus evolved
4	the dinosaur with the largest average mass

4.6.2.2 Evolution

Question 27

June 2011 | BLY1BP | Original Q5 | Legacy

QUESTION FIVE

The modern theory of evolution is based mainly on Charles Darwin's work.

Match words, **A**, **B**, **C** and **D**, with the numbers **1**–**4** in the sentences.

A extinction

B mutation

C reproduction

D variation

The range of characteristics we can see in a species is known as . . . **1** . . . .

This range of characteristics has been brought about by . . . **2** . . . .

Characteristics that give advantages are passed on during . . . **3** . . . .

Characteristics that are disadvantages may result in . . . **4** . . . .

4.6.2.2 Evolution

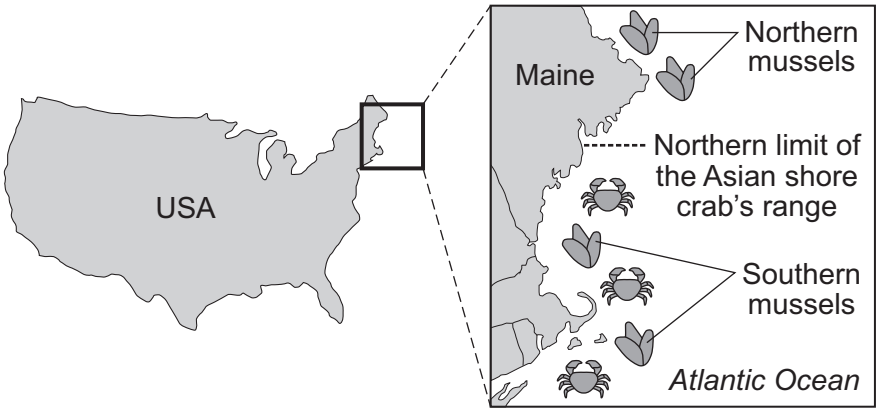
Question 28

June 2011 | BLY1BP | Original Q7 | Legacy

QUESTION SEVEN

Fifteen years ago, the Asian shore crab was brought to part of the USA. The Asian shore crabs eat mussels.

The map shows the range of the Asian shore crab now.



Native Green crabs live along the whole of the coastline.

The Southern mussels have developed thicker shells. The Asian shore crabs find the Southern mussel shells difficult to crack open.

7A Scientists had the idea that the Southern mussels had evolved because of the effect of Asian shore crabs, but the Northern mussels had not.

This idea is an example of . . .

1 a conclusion.

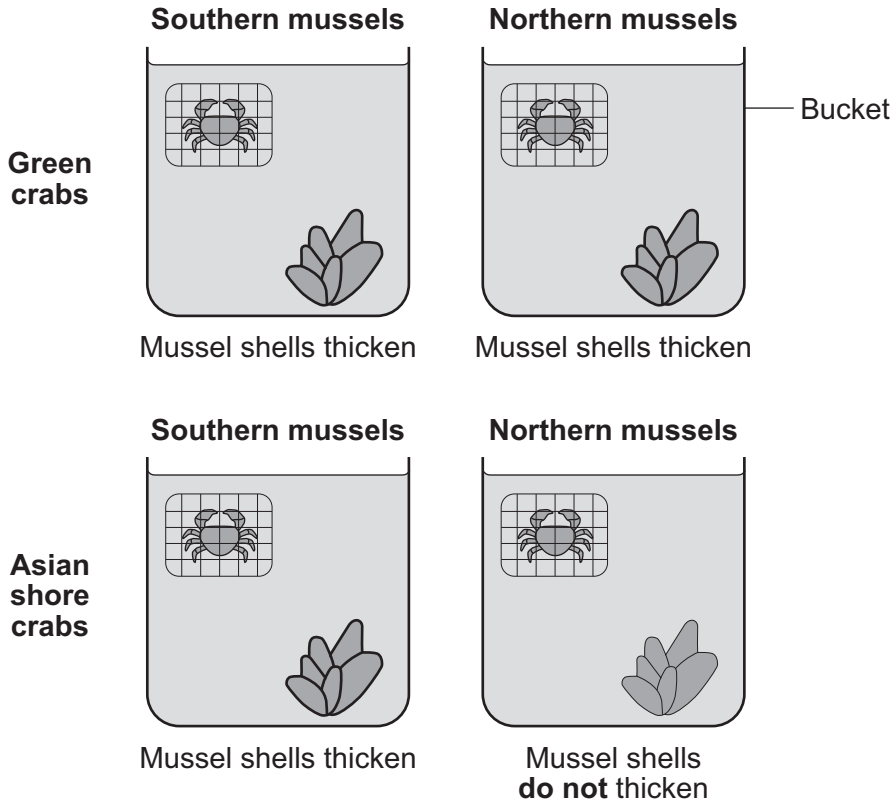
2 hearsay.

3 a hypothesis.

4 a theory.

Question 28 · continued June 2011 | BLY1BP | Original Q7 | Legacy

The scientists carried out the investigation shown in the diagram below. The scientists put mussels from different parts of the area in buckets. The scientists put different crabs in small cages inside the buckets. The crabs could not kill the mussels but the mussels could detect any chemical released by the crabs into the water. The diagram shows the results of this investigation.



7B In this investigation, the native Green crabs were used as a . . .

1 control group.

2 dependent variable.

3 placebo.

4 survey.

7C The results of the investigation show that . . .

1 both types of mussel respond to the chemicals released by the Asian shore crabs.

2 neither type of mussel responds to the chemicals released by the Asian shore crabs.

3 only the Northern mussels respond to the chemicals released by the Asian shore crabs.

4 only the Southern mussels respond to the chemicals released by the Asian shore crabs.

7D In the past 15 years, the Southern mussels have evolved the ability to . . .

1 thicken their shells.

2 detect Green crabs.

3 detect Asian shore crabs.

4 increase their range.

4.6.2.2 Evolution

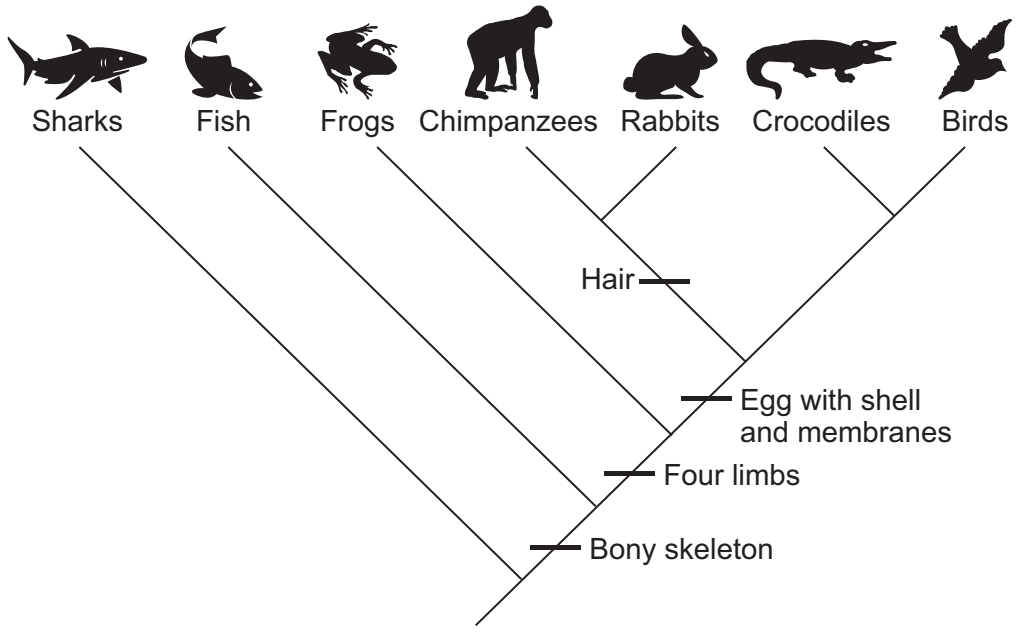
Question 29

November 2011 | BLY1BP | Original Q4 | Legacy

QUESTION FOUR

The diagram shows an evolutionary tree for some groups of animals.

The diagram also shows when some characteristics first evolved.



Match organisms, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

A birds

B chimpanzees

C fish

D sharks

1	the group most closely related to crocodiles
2	the first group to evolve
3	a group with hair
4	the group with a bony skeleton but no limbs

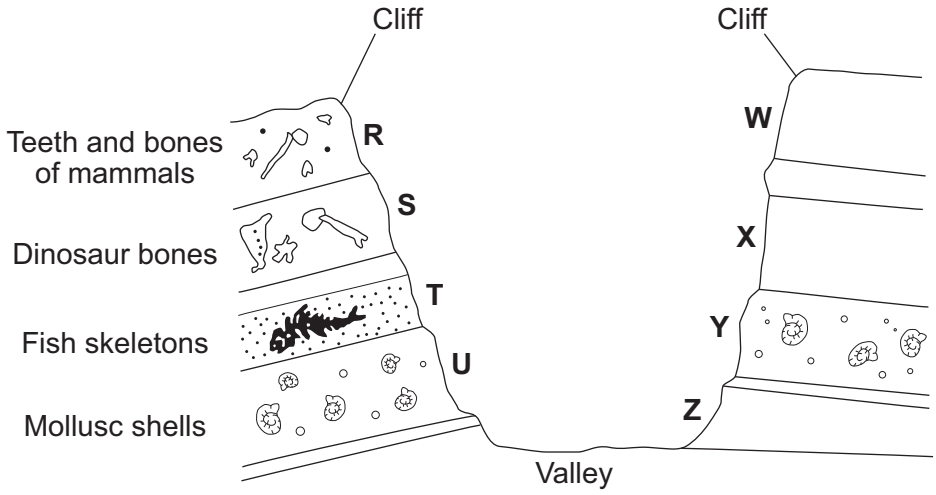
4.6.2.2 Evolution

Question 30

November 2011 | BLY1BP | Original Q8 | Legacy

QUESTION EIGHT

The diagram shows a section through rock layers containing fossils.



8A Which layers of rock are probably the same age?

1 **R** and **W**

2 **S** and **X**

3 **T** and **Z**

4 **U** and **Y**

8B Which of these statements about rocks and fossils is true?

1 Older fossils are usually found in deeper rocks.

2 Rocks of the same age in a particular area will contain fossils of totally different life forms.

3 The deeper the rock, the more different types of fossil are found.

4 Fossils are never found in surface layers of rocks.

8C There are few fossils of the earliest organisms on Earth.

This is because . . .

1 fossils last for only a few million years.

2 the organisms had soft bodies.

3 the organisms quickly became extinct.

4 new predators ate the organisms.

4.6.2.2 Evolution

Question 30 · continued

8D The fossils in the rock layers support the theory of evolution because . . .

1 the same fossil organisms are found in different layers of rocks.

2 fossil organisms have features in common with present-day organisms.

3 present-day organisms have evolved from fossil organisms.

4 the environment caused the changes in the fossil organisms.

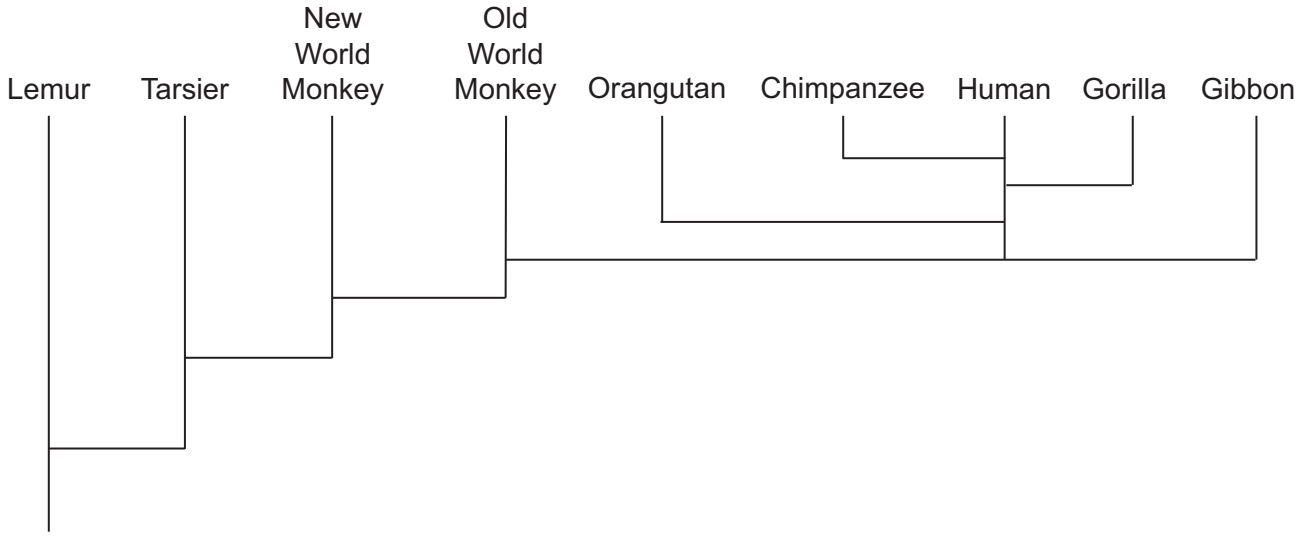
Turn over for the next question

4.6.2.2 Evolution

Question 31

January 2012 | BL1FP | Original Q3 | Legacy

3 The diagram shows the evolution of a group called the primates.



3 (a) Which primate evolved first?

.....

(1 mark)

3 (b) Name **two** primates that developed most recently from the same common ancestor as humans.

1 .....

2 .....

(2 marks)

3 (c) (i) The theory of evolution by natural selection was suggested in the 1800s.

Which scientist suggested this theory?

.....

(1 mark)

4.6.2.2 Evolution

Question 31 · continued

3 (c) (ii) Use words from the box to complete the passage about natural selection.

evolution	**environment**	**generation**
mutate	**survive**	**variation**

Individual organisms of a species may show a wide range of ..... because of differences in their genes. Individuals with characteristics most suited to the ..... are more likely to ..... and breed successfully. The genes that have helped these individuals to survive are then passed on to the next ..... .

(4 marks)

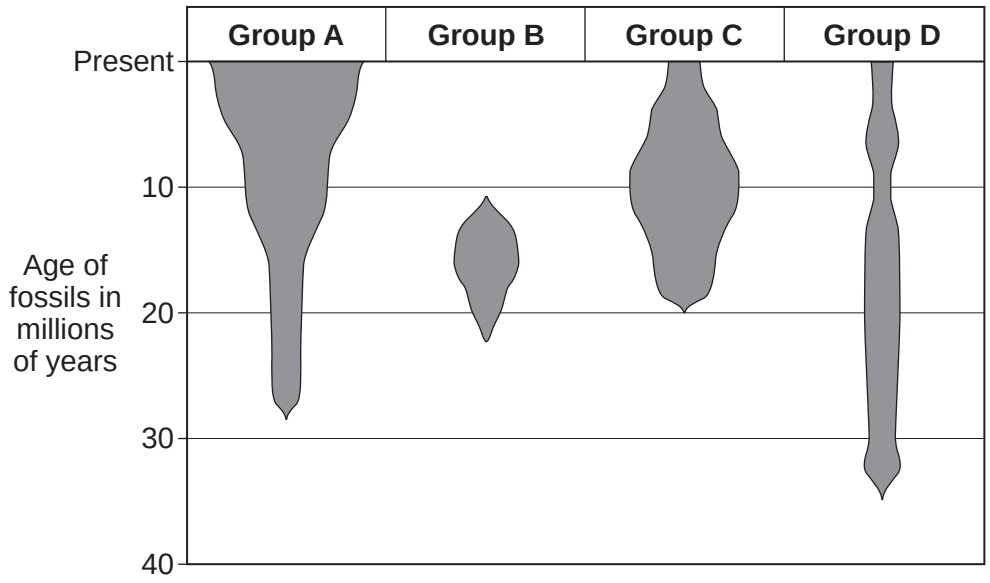
8

4.6.2.2 Evolution

Question 32

June 2012 | BL2FP | Original Q3 | Legacy

3 In the Grand Canyon, scientists have found fossils of several different groups of organisms.
The diagram shows the number and age of the fossils that the scientists found.
The width of each shaded area shows the number of fossils found.



3 (a) What is a fossil?

.....

.....

.....

.....

(2 marks)

3 (b) (i) Which group of organisms, **A**, **B**, **C** or **D**, was the first to evolve? ☐

(1 mark)

3 (b) (ii) Which group of organisms, **A**, **B**, **C** or **D**, is now extinct? ☐

(1 mark)

4.6.2.2 Evolution

Question 32 · continued

3 (b) (iii) Give **one** environmental factor that might have caused this group of organisms to become extinct.

.....

.....

(1 mark)

3 (c) Scientists suggested that, 10 million years ago, organisms of **Group C** were more common than organisms from any of the other groups.

What is the evidence for this in the diagram?

.....

.....

(1 mark)

3 (d) The scientists suggested that the four groups of fossilised organisms evolved from a common ancestor.

Which of the following would provide the best evidence that their suggestion is correct?

Tick (✓) **one** box.

Statement	Tick (✓)
All the groups lived in the same area.	
Fossils from each group were found in the same rock layer.	
Members of the groups have similar physical structures.	

(1 mark)

7

4.6.2.2 Evolution

Question 33

January 2013 | BL1FP | Original Q7 | Legacy

7 (a) Complete the sentences about evolution.

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

7 (a) (i) Darwin suggested the theory of evolution by

artificial
natural
asexual

selection.

(1 mark)

7 (a) (ii) Darwin's theory of evolution says that all species of living things have evolved from

artificial
complex
simple

life forms.

(1 mark)

7 (a) (iii) Most scientists believe that life first developed about

three billion
three million
three thousand

years ago.

(1 mark)

7 (b) Darwin's theory of evolution was only slowly accepted by other people.

Give **two** reasons why.

1 .....

.....

2 .....

.....

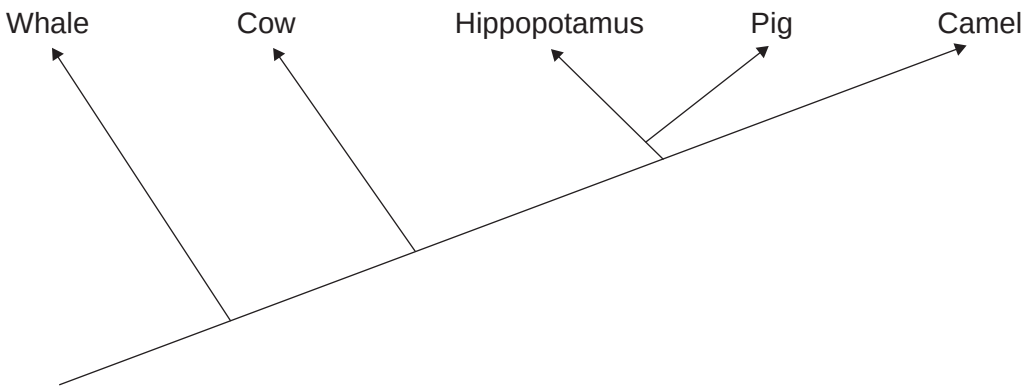
(2 marks)

4.6.2.2 Evolution

Question 33 · continued

7 (c) **Diagram 1** shows one model of the relationship between some animals.

Diagram 1



7 (c) (i) Complete the sentence.

The model shown in **Diagram 1** is an evolutionary ..... .

(1 mark)

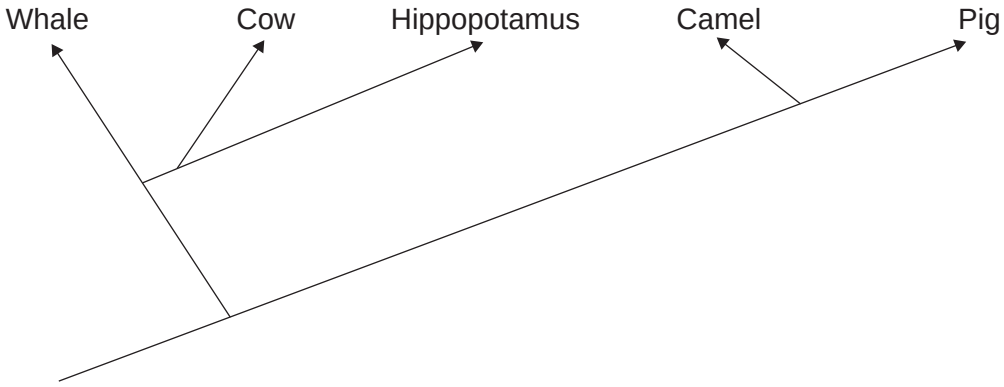
7 (c) (ii) Which **two** of the animals in **Diagram 1** are most closely related?

..... and .....

(1 mark)

7 (c) (iii) **Diagram 2** shows a more recent model of the relationship between the animals.

Diagram 2



Suggest **one** reason why scientists have changed the model of the relationships between the animals shown in the diagram.

Draw a ring around the correct answer.

more powerful computers | **new evidence from fossils** | **new species discovered**

(1 mark)

8

4.6.2.2 Evolution

Question 34

January 2013 | BL2FP | Original Q3 | Legacy

3 The photograph shows a fossil footprint. The fossil was found in a rock at the bottom of a shallow river.

Scientists believe this is the footprint of a dinosaur. The dinosaur was alive 110 million years ago.



3 (a) (i) Suggest how the fossil shown in the photograph was formed.

.....

.....

(1 mark)

3 (a) (ii) Fossils may also be formed by other methods.

Describe **one** other method of forming a fossil.

.....

.....

(1 mark)

3 (b) Dinosaurs are now extinct.

Give **two** factors that can cause extinction.

1 .....

.....

2 .....

.....

(2 marks)

4.6.2.2 Evolution

Question 34 · continued

3 (c) How can fossils give evidence for evolution?

.....

.....

(1 mark)

3 (d) Scientists are uncertain about how life began on Earth.

Why?

.....

.....

(1 mark)

6

Turn over for the next question

4.6.2.2 Evolution

Question 35

June 2013 | BL2FP | Original Q2 | Legacy

2 Evolution is the development of new species over time.
Evidence for evolution comes from *fossils*.

2 (a) (i) What is a *fossil*?

.....

.....

.....

.....

(2 marks)

2 (a) (ii) How can fossils give evidence for evolution?

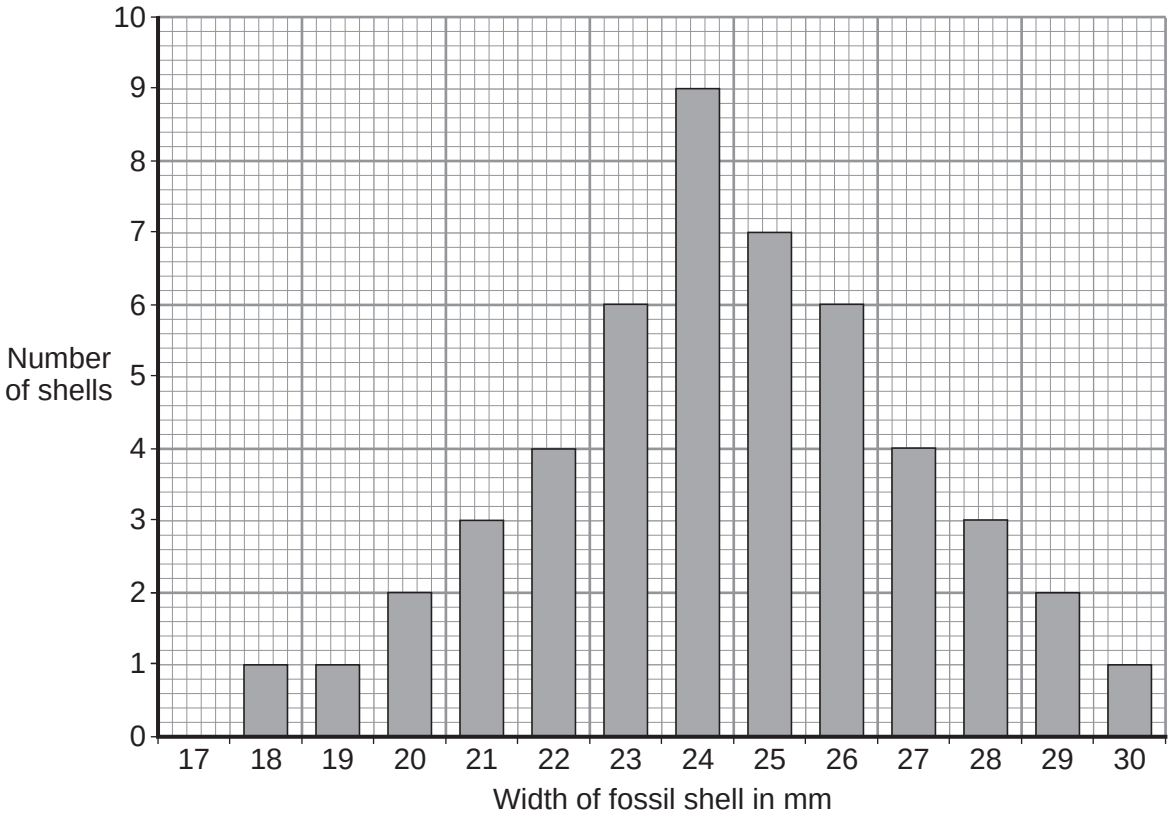
.....

.....

(1 mark)

2 (b) A species of snail lived 400 million years ago.
Scientists measured the width of 49 fossil shells of this snail.

The bar chart shows the scientists' results.



4.6.2.2 Evolution

Question 35 · continued

2 (b) (i) What is the range of the values for the width of the fossil shells for this species?

From ..... to .....

(1 mark)

2 (b) (ii) The scientists **cannot** be sure that this is the full range of fossil shell widths for this species.

Why?

.....

.....

(1 mark)

2 (c) This species of snail became extinct 380 million years ago.

Give **one** possible reason why species become extinct.

.....

.....

(1 mark)

6

4.6.2.2 Evolution

Question 36

June 2014 | BL1FP | Original Q6 | Legacy

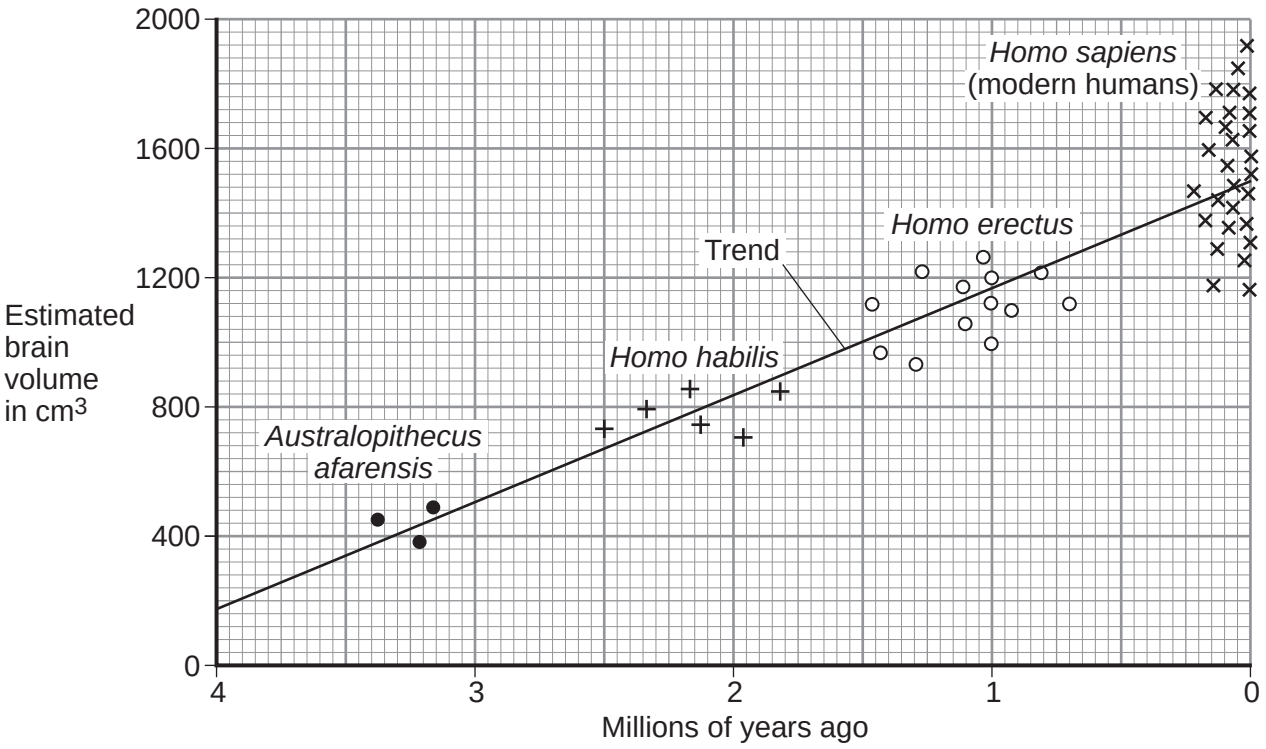
6 This question is about evolution in humans.

Figure 7 shows:

- the estimated brain volume of different species of humans
- the time when the different species existed on Earth.

The data is plotted for modern humans (*Homo sapiens*) and for three types of extinct ancestors of humans.

Figure 7



Key
Each point plotted on the graph shows the estimate for one human.

6 (a) (i) As humans evolved, their brain volume changed.

What has happened to human brain volume over the past 4 million years?

[1 mark]

.....

.....

4.6.2.2 Evolution

Question 36 · continued

6 (a) (ii) Why is the evidence for estimated brain volume for *Homo sapiens* stronger than the evidence for *Australopithecus afarensis*?

[1 mark]

.....

.....

6 (b) In a book, the brain volume of a different species, *Australopithecus africanus*, is stated to be about 600 cm^3.

Use evidence from **Figure 7** to estimate when *Australopithecus africanus* lived on Earth.

[1 mark]

Estimate = ... million years ago

6 (c) Scientists believe that modern humans evolved by natural selection from *Australopithecus afarensis*.

6 (c) (i) Complete the following sentence.

[1 mark]

In the nineteenth century, the scientist who suggested the theory of evolution by

natural selection was Charles ..... .

6 (c) (ii) In the nineteenth century, many people did **not** accept this scientist's theory.

Give **one** reason why.

[1 mark]

.....

.....

5

4.6.2.2 Evolution

Question 37

June 2014 | BL2FP | Original Q4 | Legacy

4 **Figure 6** shows a fossil of a sea animal called a Plesiosaur.
The Plesiosaur was alive about 135 million years ago.

Figure 6



4 (a) How can fossils give evidence for evolution?

Tick (✓) **one** box.

[1 mark]

Newer fossils are simpler than older fossils. ☐

Fossils show change over time. ☐

All fossils show the bones of animals. ☐

4 (b) Plesiosaurs lived in the sea. There was mud at the bottom of the sea.

Suggest how the fossil shown in **Figure 6** may have been formed after the animal died.

[3 marks]

.....

.....

.....

.....

.....

.....

4.6.2.2 Evolution

Question 37 · continued

4 (c) **Figure 7** shows what scientists think a living Plesiosaur may have looked like.

Figure 7



Scientists think that the Plesiosaur had smooth skin, with no scales.

The scientists **cannot** be certain what the skin of a Plesiosaur was like.
Suggest why.

[1 mark]

.....

.....

4 (d) Plesiosaurs are now extinct.

Give **two** possible reasons why.

[2 marks]

1 .....

.....

2 .....

.....

7

4.6.2.2 Evolution

Question 38

June 2015 | BL1FP | Original Q7 | Legacy

7 In the 1800s, Charles Darwin visited the Galapagos Islands.
On the islands he found many different species of bird called finches.
Darwin thought that all the different finch species had evolved from one species of finch that had reached the islands many years before.

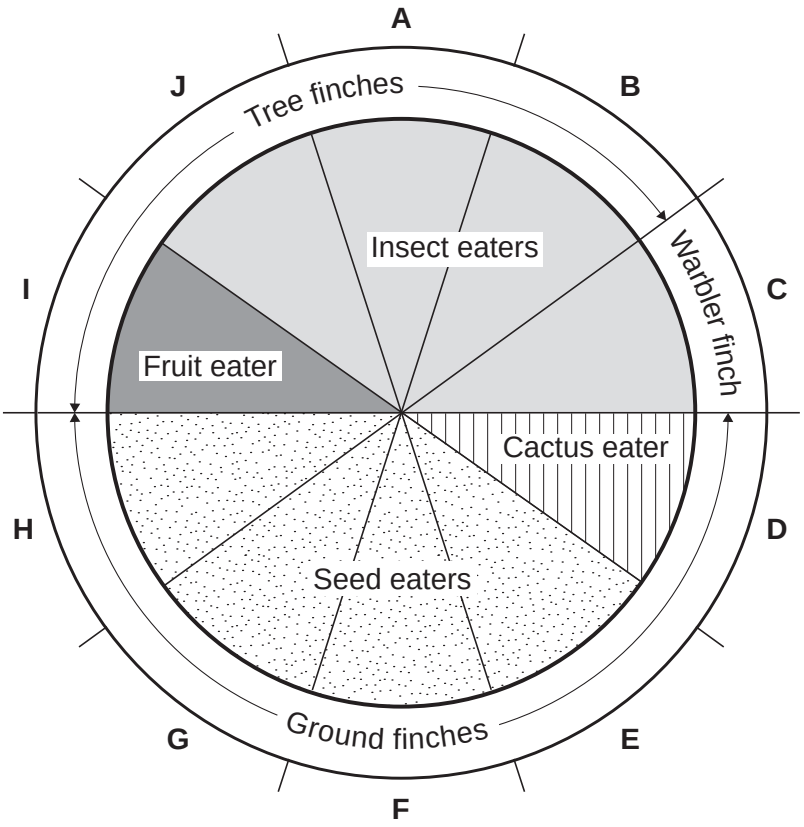
7 (a) Complete the following sentence.

[1 mark]

Darwin suggested the theory of evolution by natural ..... .

7 (b) **Figure 9** shows information about ten species of finch, **A – J**.

Figure 9



7 (b) (i) How many of the species of finch eat insects?

Draw a ring around the correct answer.

[1 mark]

4 **5** **6**

4.6.2.2 Evolution

Question 38 · continued

7 (b) (ii) Describe finch species **G**.

Use **only** information from **Figure 9**.

[2 marks]

.....

.....

.....

.....

7 (c) When Darwin returned to the UK very few people believed his theory of evolution.

A different scientist suggested that the changes that occur in an organism during its lifetime can be inherited by its offspring.

What was the name of this scientist?

Tick (✓) **one** box.

[1 mark]

Lamarck ☐

Mendel ☐

Semmelweis ☐

5

4.6.2.2 Evolution

Question 39

June 2016 | BL1FP | Original Q6 | Legacy

6 Darwin's theory of natural selection states that all living things have evolved from simple life forms.

6 (a) Use the correct answer from the box to complete the sentence.

[1 mark]

three billion	three million	three thousand

Darwin's theory states that life began on Earth _____ years ago.

6 (b) Life evolved due to changes in genes. Changes in genes cause variation.

Complete the sentences.

[2 marks]

Changes in genes are called _____ .

Individuals with characteristics most suited to the environment are more likely to survive and _____ .

3

4.6.2.2 Evolution

Question 40

June 2016 | BL2FP | Original Q5 | Legacy

5 Over millions of years:

- new groups of organisms have evolved
- other groups of organisms have become extinct.

5 (a) If an asteroid collided with the Earth, large amounts of dust and water vapour would be thrown up into the air. This would mean less light and heat would reach the Earth's surface from the Sun.

5 (a) (i) A reduced amount of light and heat could have caused the extinction of plants.

Suggest how.

[1 mark]

5 (a) (ii) How could the extinction of plants have caused the extinction of some animals?

[1 mark]

5 (a) (iii) Give **two** reasons, other than collision with an asteroid, why groups of animals may become extinct.

[2 marks]

1

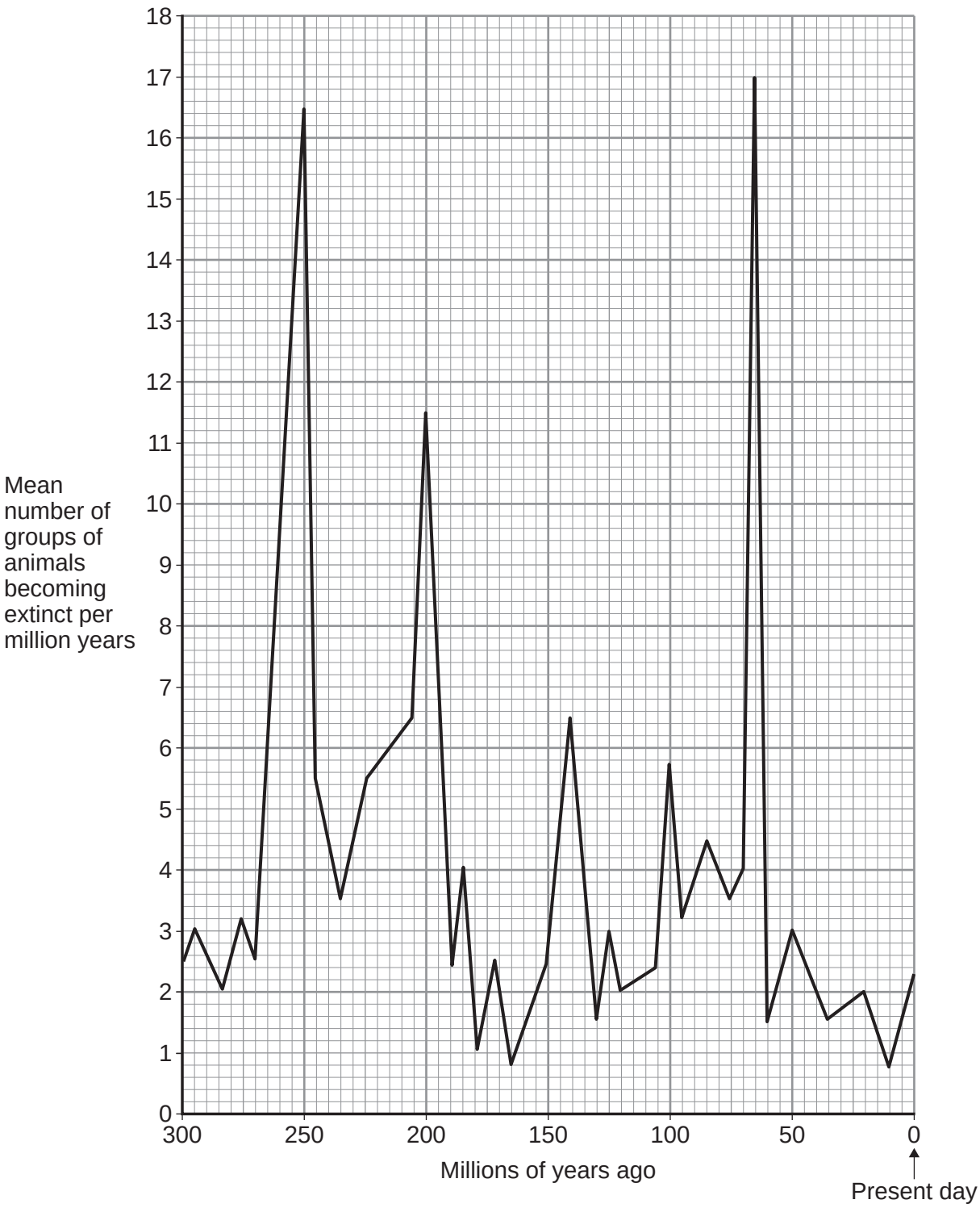
2

Question 5 continues on the next page

Question 40 · continued

5 (b) **Figure 6** shows how the rate of extinction of groups of animals has varied over the past 300 million years.

Figure 6



4.6.2.2 Evolution

Question 40 · continued

5 (b) (i) If more than 10 groups of animals become extinct in a 1 million year period, scientists call this a 'mass extinction'.

How many mass extinctions occurred over the past 300 million years?

[1 mark]

_____

5 (b) (ii) How do we know what types of animals lived hundreds of millions of years ago?

[1 mark]

_____

_____

5 (c) Use information from **Figure 6** to answer questions **(c)(i)** and **(c)(ii)**.

5 (c) (i) How many years ago did the most recent mass extinction of animals occur?

[1 mark]

Tick (✓) **one** box.

50 million years ago ☐

65 million years ago ☐

250 million years ago ☐

5 (c) (ii) What was the mean number of groups of animals becoming extinct per million years in the most recent mass extinction?

[1 mark]

_____ groups per million years

5 (c) (iii) Why are scientists not sure how many groups of animals became extinct in the most recent mass extinction?

[1 mark]

_____

_____

9

4.6.2.2 Evolution

Question 41

June 2017 | BL1FP | Original Q8 | Legacy

8 Charles Darwin developed the theory of evolution by natural selection in the 1800s.

8 (a) Describe the process of evolution by natural selection.

[3 marks]

8 (b) In the 1870s, cartoons of Darwin looking like a monkey were published in magazines.

The cartoons were published after Darwin wrote a book about his theory of evolution.

8 (b) (i) Suggest **one** reason why cartoons of Darwin looking like a monkey were drawn.

[1 mark]

8 (b) (ii) Give **two** reasons why Darwin's theory of evolution by natural selection was only gradually accepted.

[2 marks]

6

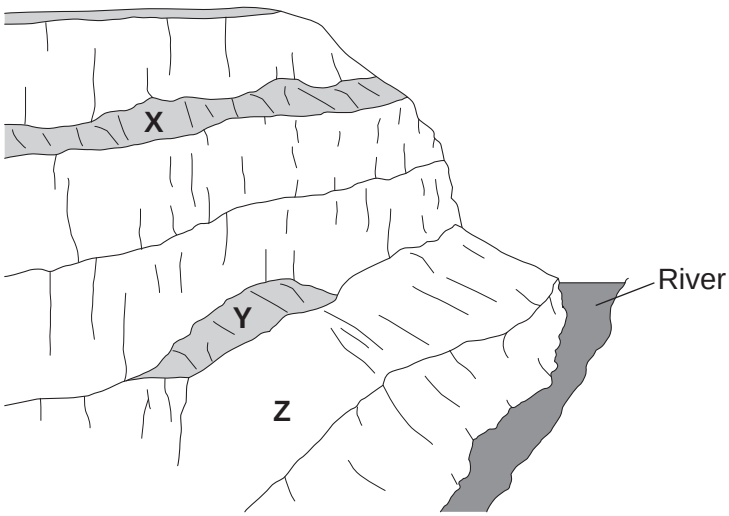
4.6.2.2 Evolution

Question 42

June 2017 | BL2FP | Original Q2 | Legacy

2 (a) **Figure 2** shows layers of rock in the Grand Canyon.

Figure 2



Scientists found fossils of three different species of animal, **X**, **Y** and **Z**, at the positions shown in **Figure 2**.

2 (a) (i) What is a fossil?

[2 marks]

2 (a) (ii) Scientists think that animal **Y** was alive at an earlier time than animal **X**.

How does **Figure 2** provide evidence for this?

[1 mark]

4.6.2.2 Evolution

Question 42 · continued

2 (a) (iii) Which **two** of the following are evidence that animal **Y** may have evolved from animal **Z**?

[2 marks]

Tick (✓) **two** boxes.

The fossils of animals **X**, **Y** and **Z** are the same size. ☐

The fossils of animals **Y** and **Z** have many features in common. ☐

The fossils of animals **Y** and **Z** have the same skin colour. ☐

The fossil of animal **Y** is more complex than the fossil of animal **Z**. ☐

The fossil of animal **Y** is more similar to the fossil of animal **X** than to the fossil of animal **Z**. ☐

2 (b) Animals **X**, **Y** and **Z** are all now extinct.

2 (b) (i) Give **two** possible causes of extinction.

[2 marks]

1 _____

_____

2 _____

_____

2 (b) (ii) Scientists cannot be sure about what caused animals **X**, **Y** and **Z** to become extinct.

Suggest why.

[1 mark]

_____

_____

8

4.6.2.2 Evolution

Question 43

June 2018 | 8461/2F | Original Q3

0 3 Fossils give evidence about organisms that lived a long time ago.

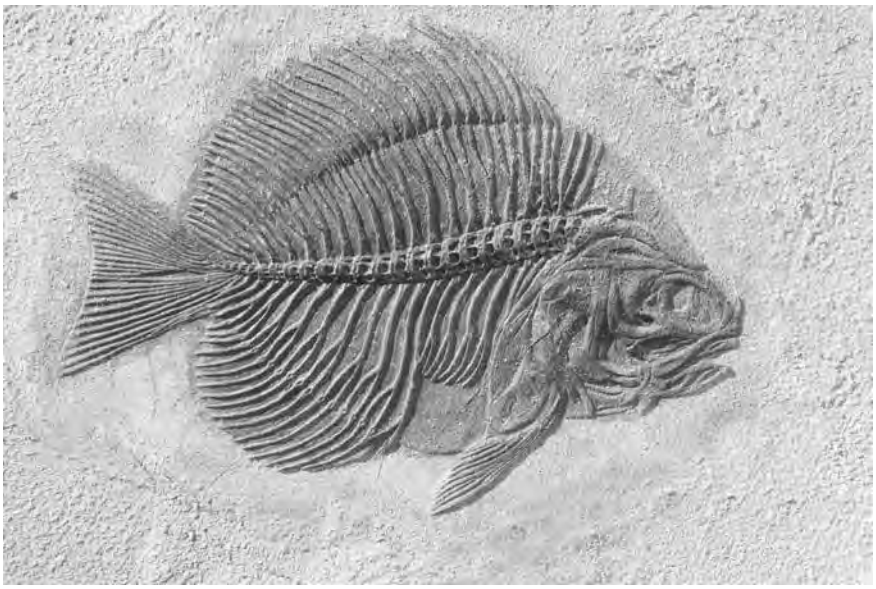
0 3 . 1 Scientists have found very few fossils of the earliest life forms.

Give **one** reason why.

[1 mark]

Figure 3 is a photograph of a fossilised fish.

Figure 3



0 3 . 2 Suggest how the fossil in **Figure 3** was formed.

[2 marks]

4.6.2.2 Evolution

Question 43 · continued

0 3 . 3 The species of fish shown in **Figure 3** is now extinct.

Give **two** possible causes of extinction.

[2 marks]

1 _____

_____

2 _____

_____

Modern fish species have evolved from fish that lived a long time ago.

Evolution is caused by mutation and natural selection.

0 3 . 4 What is a mutation?

[1 mark]

Tick **one** box.

A change in a gene ☐

Accidental damage to an organism ☐

An organism with a new characteristic ☐

The loss of a species ☐

0 3 . 5 Describe the process of natural selection.

[3 marks]

_____

_____

_____

_____

_____

_____

9

4.6.2.2 Evolution

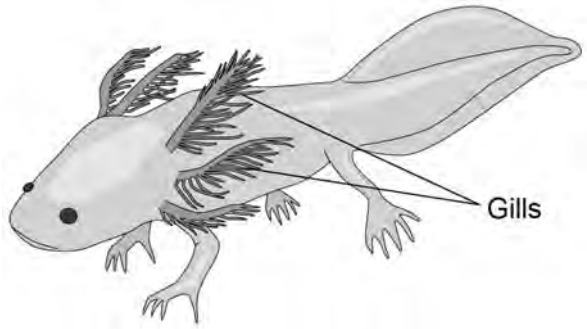
Question 44

June 2019 | 8461/1F | Original Q2

0 2 An animal called an axolotl lives in water.

Figure 3 shows an axolotl.

Figure 3



Oxygen enters the axolotl's bloodstream through the gills by diffusion.

0 2 . 1 What is diffusion?

[1 mark]

Tick (✓) **one** box.

The movement of particles from a high concentration to a low concentration ☐

The movement of particles from a low concentration to a high concentration ☐

The movement of water from a concentrated solution to a more dilute solution ☐

0 2 . 2 Describe how **one** feature of the axolotl's gills increases the rate of diffusion of oxygen.

Use information from **Figure 3**.

[2 marks]

Feature _____

Description _____

_____

_____

4.6.2.2 Evolution

Question 44 · continued

If a gill of an axolotl is removed, stem cells in the damaged area will divide and a new gill will grow.

0 2 . 3 Complete the sentence.

[1 mark]

Choose the answer from the box.

adaptation	**differentiation**	**evolution**	**variation**

When stem cells specialise to produce gill cells, this process is

known as _____.

0 2 . 4 Complete the sentence.

[1 mark]

Choose the answer from the box.

binary fission	**mitosis**	**mutation**

To grow a new gill the stem cells divide by _____.

0 2 . 5 Which **one** of the following does **not** contain stem cells?

[1 mark]

Tick (✓) **one** box.

- Bone marrow ☐
- Embryos ☐
- Hair ☐
- Meristem tissue ☐

4.6.2.2 Evolution

Question 44 · continued

0 2 . 6 Axolotls are small animals. Axolotls are used in stem cell research.

What are **two** advantages of using axolotls in stem cell research?

[2 marks]

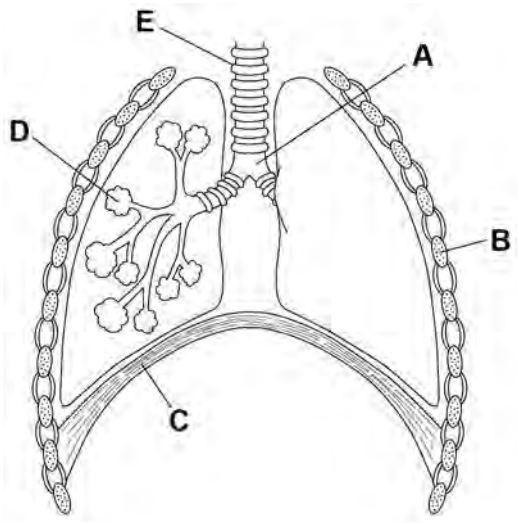
Tick (✓) **two** boxes.

- Axolotls are cheap to feed. ☐
- Axolotls are easy to breed. ☐
- Axolotls are endangered. ☐
- Axolotls live in water. ☐
- Axolotl research is cruel. ☐

Oxygen uptake in humans takes place in the lungs.

Figure 4 shows the human breathing system.

Figure 4



0 2 . 7 Where does oxygen enter the bloodstream?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

0 2 . 8 Name part **E** on **Figure 4**.

[1 mark]

0 2 . 9 Which blood vessel carries blood to the lungs?

[1 mark]

Tick (✓) **one** box.

Aorta ☐

Pulmonary artery ☐

Vena cava ☐

11

4.6.2.2 Evolution

Question 45

November 2021 | 8461/2F | Original Q1

0 1 The theory of evolution states that organisms alive today evolved by natural selection from other species that are now extinct.

0 1 . 1 Which **two** scientists proposed the theory of evolution by natural selection?

[2 marks]

Tick (✓) **two** boxes.

- Alexander Fleming ☐
- Alfred Russel Wallace ☐
- Carl Linnaeus ☐
- Carl Woese ☐
- Charles Darwin ☐

Fossils provide evidence for evolution.

Figure 1 shows a fossil footprint of a dinosaur.

Figure 1



4.6.2.2 Evolution

Question 45 · continued

0 1 . 2 What is a fossil?

[2 marks]

0 1 . 3 How was the fossil in **Figure 1** formed?

[1 mark]

Tick (✓) **one** box.

Body parts were replaced by minerals. ☐

The animal walked on mud. ☐

The animal was frozen in ice. ☐

0 1 . 4 Dinosaurs are extinct.

Give **two** causes of extinction.

[2 marks]

1

2

Question 1 continues on the next page

4.6.2.2 Evolution

Question 45 · continued

0 1 . 5 Which **two** of the following provide evidence for evolution?

[2 marks]

Tick (✓) **two** boxes.

Bacteria can become resistant to an antibiotic. ☐

Early forms of life lived in the ocean. ☐

Older fossils are simpler than more recent ones. ☐

Older layers of rock are closer to the surface. ☐

9

4.6.2.2 Evolution

Question 46

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**

4.6.2.2 Evolution

Question 46 · 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

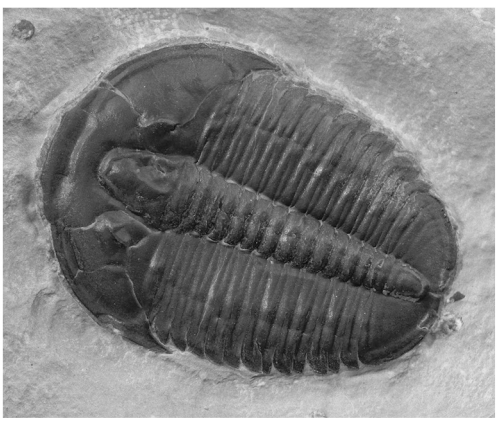
4.6.2.2 Evolution

Question 46 · continued

Figure 10 shows fossils of the two species of trilobite.

Figure 10

Trilobite A



Trilobite B

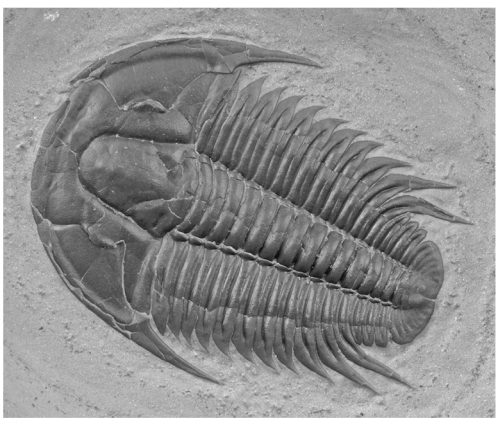
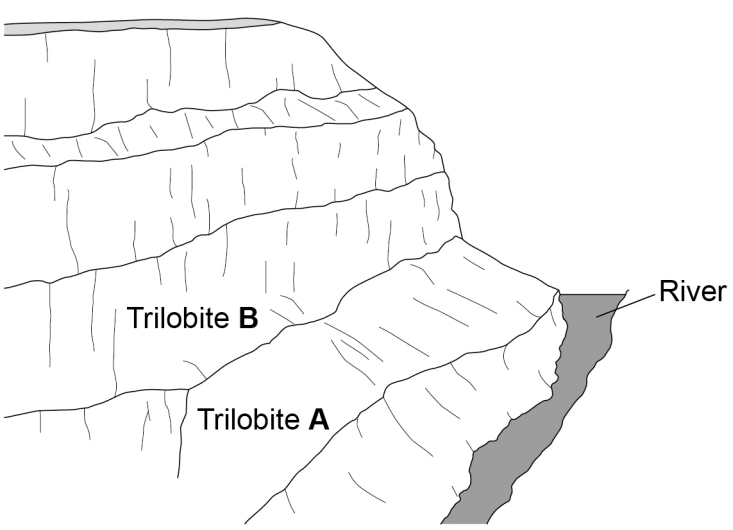


Figure 11 shows:

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

Figure 11



Question 46 · 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 _____.

4.6.2.2 Evolution

Question 46 · 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

4.6.2.2 Evolution

Question 47

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 ☐

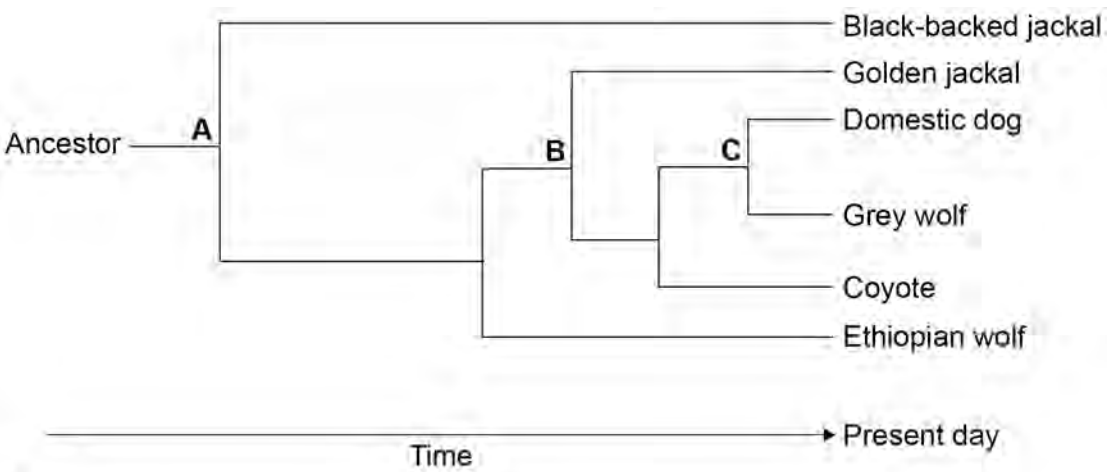
Question 2 continues on the next page

Question 47 · 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 ☐

4.6.2.2 Evolution

Question 47 · 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

4.6.2.2 Evolution

Question 47 · 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

4.6.2.2 Evolution

Question 48

June 2024 | 8461/2F | Original Q9

0 9 Evolution of new species occurs by mutation and natural selection.

0 9 . 1 What is a mutation?

[1 mark]

0 9 . 2 Describe the process of natural selection.

[3 marks]

0 9 . 3 Which scientists suggested the theory of evolution by natural selection?

[1 mark]

Tick (✓) **one** box.

- Alexander Fleming and Carl Woese ☐
- Alfred Wallace and Alexander Fleming ☐
- Alfred Wallace and Charles Darwin ☐
- Charles Darwin and Carl Woese ☐

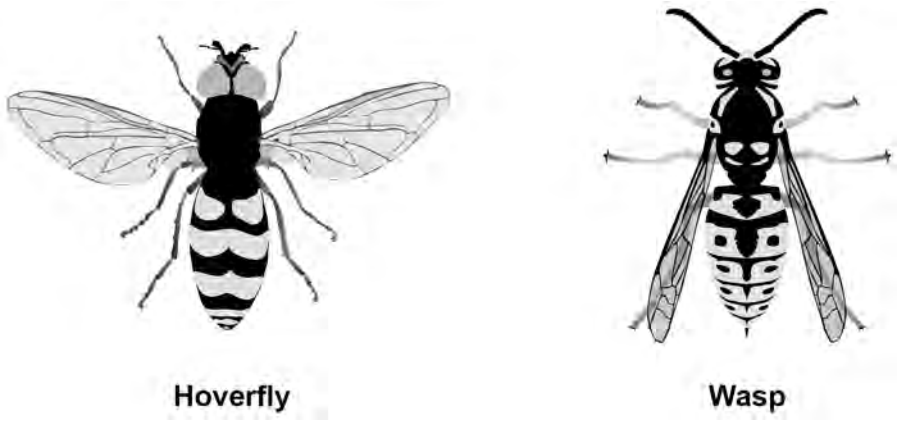
4.6.2.2 Evolution

Question 48 · continued

0 9 . 4 The hoverfly and the wasp are insects with bright yellow and black markings.

Figure 12 shows a hoverfly and a wasp.

Figure 12



The wasp has a sting to defend itself against predators.

The hoverfly does **not** have a sting.

Hoverflies and wasps live in the same habitat.

Explain how having yellow and black markings helps the **hoverfly** survive.

[3 marks]

8