AQA GCSE Biology | 8461

SPECIFICATION POINT 4.6.4

Classification of living organisms

Past-paper questions

Tier	**Higher**
Question groups	**8**
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 Q3 | Legacy

QUESTION THREE

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

3A 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.

3B Scientists think that the earliest life forms first appeared on Earth . . .

1 about 1 billion years ago.

2 about 3 billion years ago.

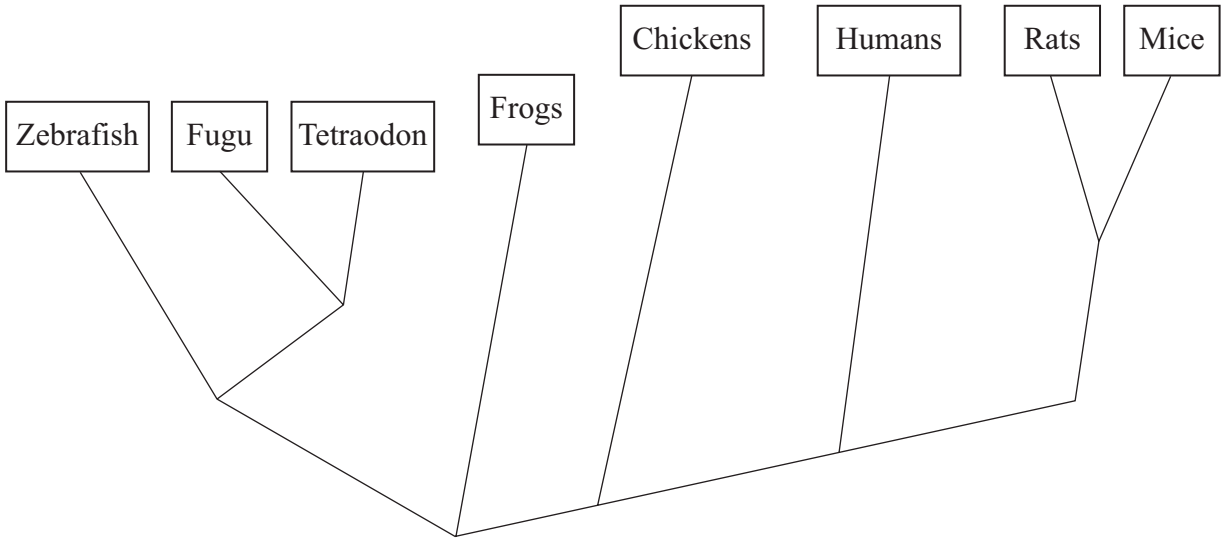
3 about 10 billion years ago.

4 about 30 billion years ago.

4.6.4 Classification of living organisms

Question 01 · continued

The diagram shows an evolutionary tree.



3C The evolutionary tree represents . . .

1 facts about evolution.

2 hearsay about evolution.

3 predictions about evolution.

4 a guess about evolution.

3D 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.

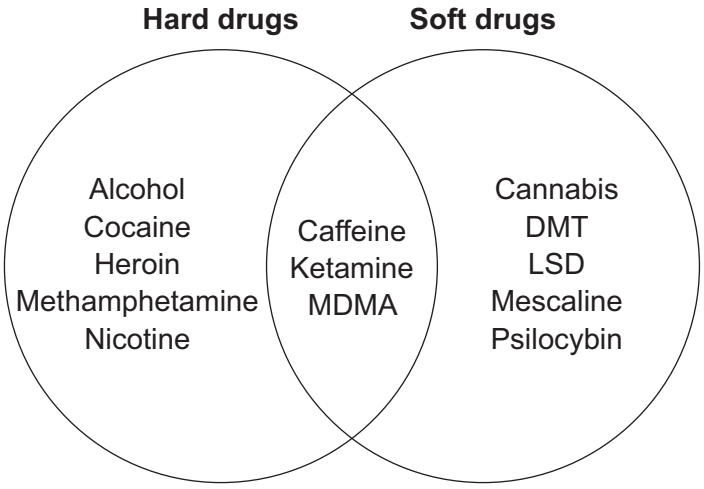
4.6.4 Classification of living organisms

Question 02

November 2011 | BLY1AP | Original Q9 | Legacy

QUESTION NINE

Most drugs can be classified as hard drugs or soft drugs.
The diagram shows the classification of some different drugs.



9A The diagram shows that . . .

1 hard drugs are legal but soft drugs are illegal.

2 all drugs can be classified as ‘hard’ or ‘soft’.

3 hard drugs are illegal but soft drugs are legal.

4 the classification of drugs depends on more than one factor.

9B People who smoke tobacco may have withdrawal symptoms when they try to give up smoking.

What is the cause of these symptoms?

1 Regular smokers get used to the effects of nicotine so need more nicotine to get the same effect.

2 People who give up smoking often feel sick, may shake and put on weight.

3 Nicotine causes changes in chemical processes of the body.

4 Tobacco smoke contains carcinogenic substances which damage cells in the lungs.

Question 02 · continued

The table shows some of the symptoms of giving up smoking.

Symptom	How long the symptom lasts after giving up smoking
Anxiety	2–4 weeks
Decreased heart rate	More than 10 weeks
Depression	Less than 3 weeks
Increased aggression	4 weeks
Increased appetite	More than 10 weeks
Restless sleep	Less than 1 week
Poor concentration	1 week

9C Which conclusion does the information in the table support?

1 Smoking may help you to lose weight.

2 Smoking makes concentration worse.

3 Smoking makes someone more aggressive.

4 Smoking tends to slow down the heart rate.

9D Which row in the table shows the symptoms that may last for at least three weeks after giving up smoking?

	Symptom				
	Anxiety	**Decreased heart rate**	**Depression**	**Increased aggression**	**Restless sleep**
1	✓		✓	✓	
2		✓		✓	✓
3			✓	✓	✓
4	✓	✓		✓	

END OF TEST

4.6.4 Classification of living organisms

Question 03

June 2014 | BL1HP | Original Q6 | Legacy

6 Drugs may harm the human body.

6 (a) The drug thalidomide was originally developed in the 1950s.

6 (a) (i) What was the drug thalidomide originally developed to treat?

[1 mark]

.....

6 (a) (ii) Soon after it was developed, thalidomide was found to be useful in treating another condition.

What was this other condition?

[1 mark]

.....

6 (a) (iii) Describe **one** harmful effect of thalidomide.

[1 mark]

.....

6 (a) (iv) Suggest why this harmful effect had **not** been detected during clinical drug trials on thalidomide.

[1 mark]

.....

.....

6 (b) Using a recreational drug may cause a person to become dependent on the drug.

6 (b) (i) What happens in the body to make someone dependent on a drug?

[1 mark]

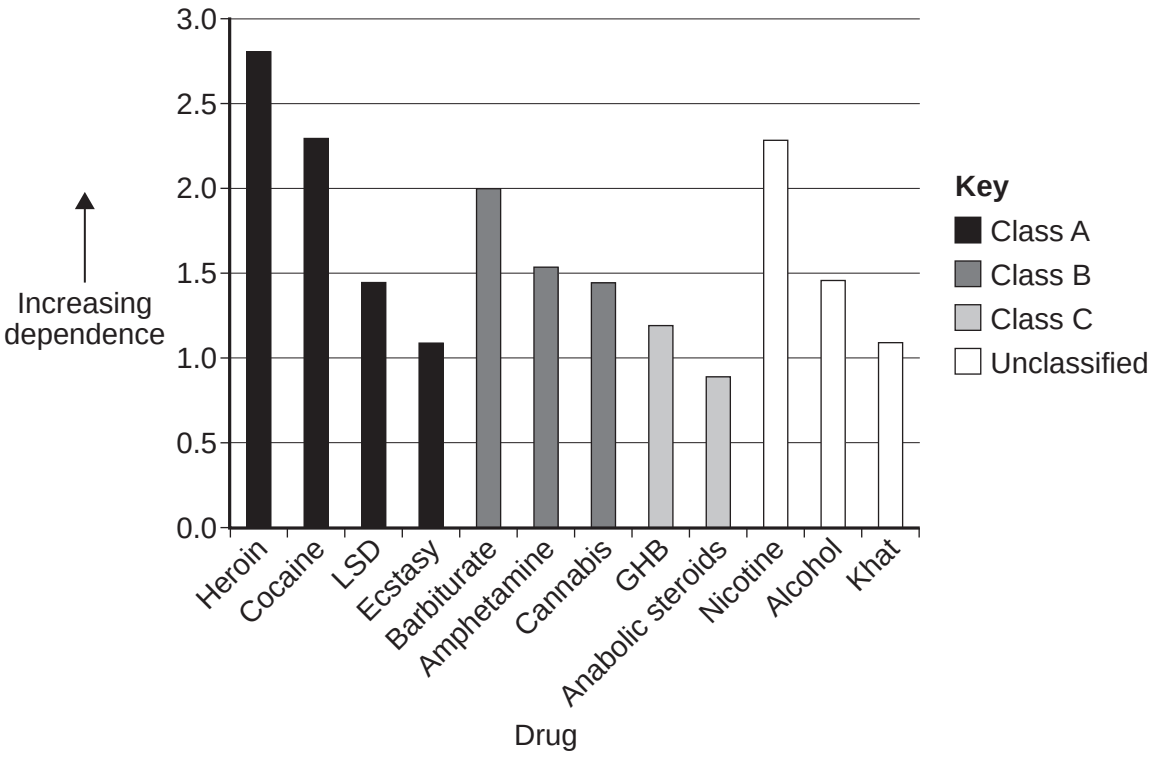
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Question 03 · continued

6 (b) (ii) Doctors rated different recreational drugs according to how dependent users had become on them. **Figure 4** shows the results.

Figure 4



It is illegal (against the law) to take Class A, B or C drugs.
Unclassified drugs are legal.

Some people think that some legal drugs should be made illegal.
What evidence is there in **Figure 4** to support this view?

[2 marks]

.....

.....

.....

.....

6 (b) (iii) Suggest **one** other piece of information about legal drugs that would need to be considered before the classification of these drugs was changed.

[1 mark]

.....

8

4.6.4 Classification of living organisms

Question 04

June 2017 | BL2HP | Original Q7 | Legacy

7 There are nearly 9 million species of organisms alive on Earth today.

7 (a) (i) What is a species?

[2 marks]

7 (a) (ii) How do fossils provide evidence that species alive today have evolved from simpler organisms?

[2 marks]

7 (b) **Figure 7** shows three species of flightless birds that are alive today.

Each of the three species lives on a different continent.

Figure 7

Rhea (South America)



Emu (Australia)



Ostrich (Africa)



4.6.4 Classification of living organisms

Question 04 · continued

Many scientists now believe that each of these species evolved from an ancestral species of bird that could fly. This happened after the extinction of the dinosaurs, about 65 million years ago. Many of the dinosaurs were meat eaters.

Although these three birds are different species, they have many features in common.

Suggest how these different species of flightless birds might have evolved to have many features in common.

[6 marks]

10

4.6.4 Classification of living organisms

Question 05

June 2018 | 8461/2H | Original Q9

0 9 **Figure 12** shows a ring-tailed lemur.

Figure 12



Table 5 shows part of the classification of the ring-tailed lemur.

Table 5

Classification group	Name
Kingdom	*Animalia*
Phylum	*Chordata*
	Mammalia
	Primates
	Lemuroidea
Genus	*Lemur*
	catta

0 9 . 1 Complete **Table 5** to give the names of the missing classification groups.

[2 marks]

0 9 . 2 Give the binomial name of the ring-tailed lemur.

Use information from **Table 5**.

[1 mark]

Question 05 · continued

Lemurs are only found on the island of Madagascar.

Madagascar is off the coast of Africa.

Scientists think that ancestors of modern lemurs evolved in Africa and reached Madagascar about 50-60 million years ago.

Today there are many species of lemur living on Madagascar.

Figure 13 shows information about water currents.

Figure 14 shows the distribution of three species of lemur on Madagascar.

Figure 13

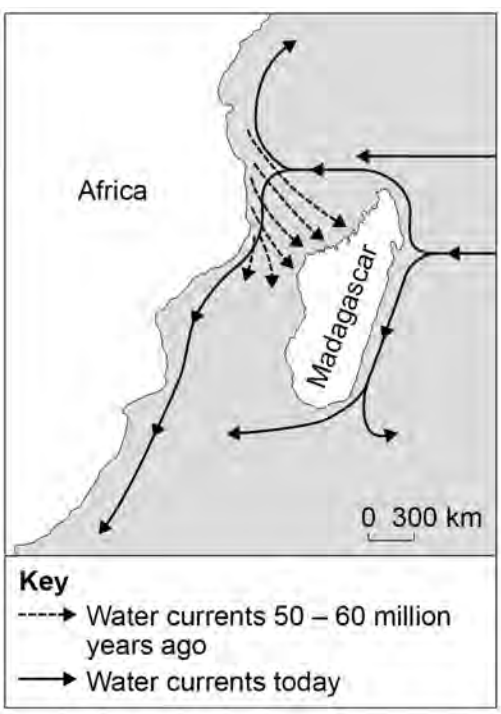
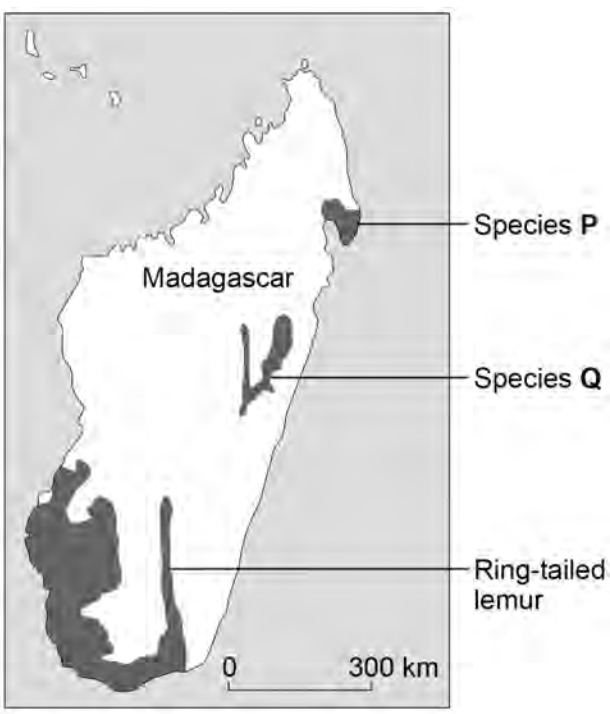


Figure 14



0 9 . 3 Suggest how ancestors of modern lemurs reached Madagascar.

[1 mark]

4.6.4 Classification of living organisms

Question 05 · continued

0 9 . 4 Describe how the ancestors of modern lemurs may have evolved into the species shown in **Figure 14**.

[5 marks]

9

Question 06

0 5 **Table 2** gives the classification of four plant species.

Table 2

Group	Species 1	Species 2	Species 3	Species 4
Kingdom	*Plantae*	*Plantae*	*Plantae*	*Plantae*
Phylum	*Spermatophyta*	*Spermatophyta*	*Spermatophyta*	*Spermatophyta*
Class	*Monocotyledonae*	*Dicotyledonae*	*Monocotyledonae*	*Dicotyledonae*
Order	*Poales*	*Fabales*	*Poales*	*Scrophulariales*
Family	*Cyperaceae*	*Fabaceae*	*Poaceae*	*Scrophulariaceae*
Genus	*Eriophorum*	*Pisum*	*Poa*	*Antirrhinum*
Species	*angustifolium*	*sativum*	*annua*	*majus*

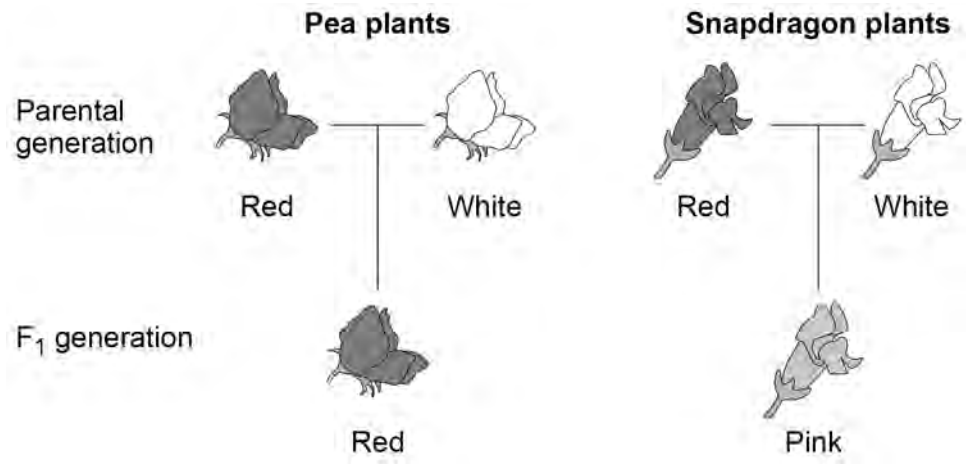
0 5 . 1 Species **1** and **3** are the most closely related.

What information in **Table 2** gives evidence for this?

[1 mark]

Figure 6 shows the inheritance of flower colour in two species of plant.

Figure 6



- In pea plants and in snapdragon plants, flower colour is controlled by one pair of alleles.
- In **Figure 6** the parental generation plants are homozygous for flower colour.
- In heterozygous **pea** plants, the allele for red flower colour is dominant.
- In heterozygous **snapdragon** plants, the alleles for flower colour are both expressed.

Question 06 · continued

Use the following symbols for alleles in your answers to Questions **05.2** to **05.4**:

Pea plants	**Snapdragon plants**
R = allele for red flowers	C^R = allele for red flowers
r = allele for white flowers	C^W = allele for white flowers

0 5 . 2 What is the genotype of the red-flowered pea plants in the F_1 generation?

[1 mark]

_____

0 5 . 3 What is the genotype of a white-flowered snapdragon plant?

[1 mark]

_____

A gardener crossed two pink-flowered snapdragon plants.

0 5 . 4 Draw a Punnett square diagram to show why only some of the next generation plants had pink flowers.

Identify the phenotypes of all the offspring plants.

[3 marks]

0 5 . 5 What percentage of the offspring would you expect to have pink flowers?

[1 mark]

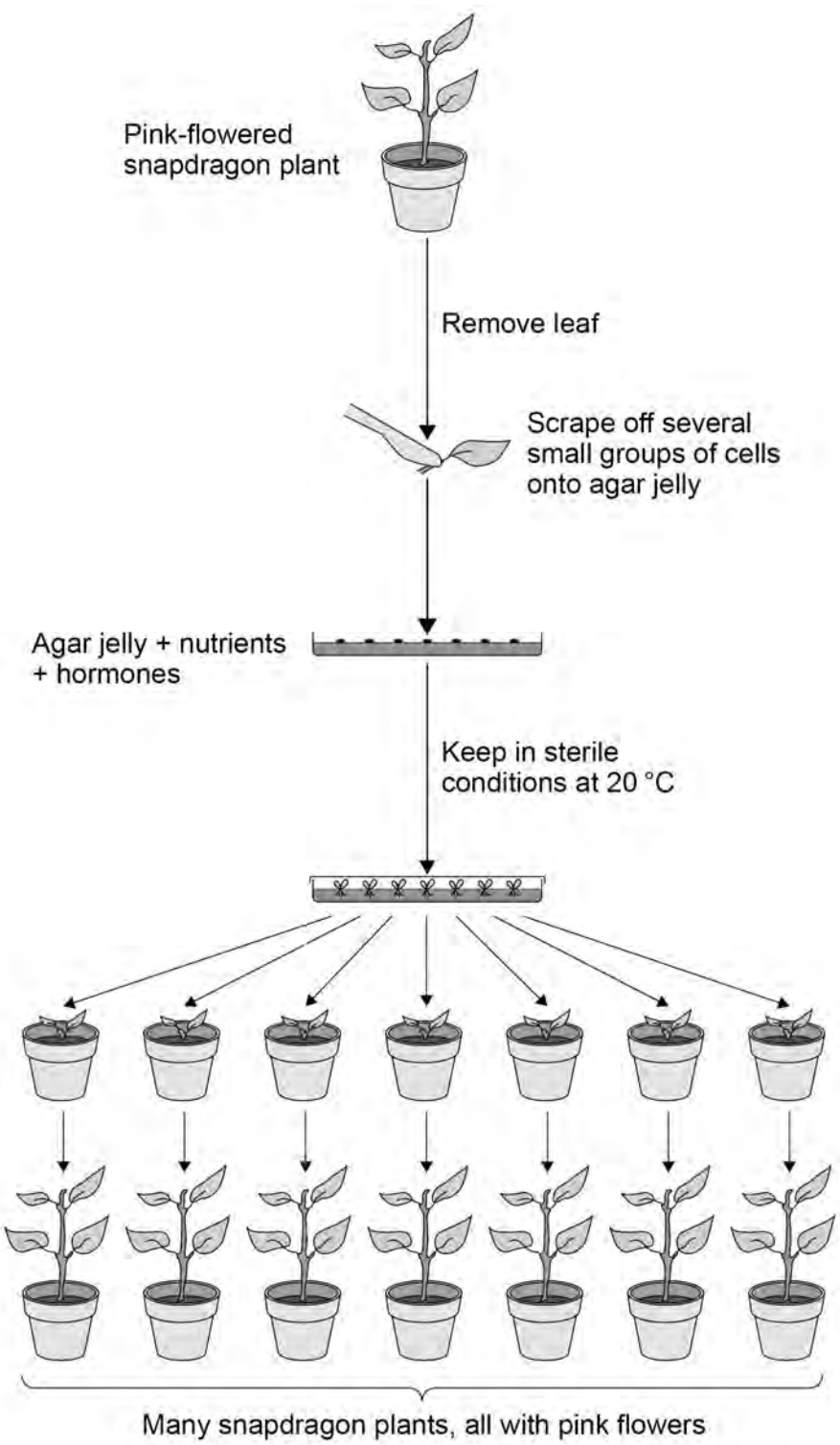
Percentage = _____ %

Question 06 · continued

Commercially, hundreds of pink-flowered snapdragon plants can be produced from one pink-flowered plant.

Figure 7 shows a tissue culture technique used for producing many plants from one plant.

Figure 7



Question 06 · continued

0 5 . 6 Give a reason for each of the following steps shown in **Figure 7**.

[5 marks]

Several groups of cells are scraped off the leaf: _____

Nutrients are added to the agar jelly: _____

Hormones are added to the agar jelly: _____

The plant cells are kept in **sterile** conditions: _____

The plant cells are kept at **20 °C**: _____

0 5 . 7 Explain why the method shown in **Figure 7** produces **only** pink-flowered plants.

[2 marks]

14

4.6.4 Classification of living organisms

Question 07

0 9 The Galapagos Islands are located in the Pacific Ocean.

Several species of birds called finches live on the Galapagos Islands.

These finches are very similar to each other.

Figure 15 shows two modern species of Galapagos finch and their classification.

Figure 15

Medium ground finch



Small ground finch



Classification group	Medium ground finch	Small ground finch
Kingdom	*Animalia*	*Animalia*
	Chordata	*Chordata*
Class	*Aves*	*Aves*
	Passeriformes	*Passeriformes*
	Thraupidae	*Thraupidae*
Genus	*Geospiza*	*Geospiza*
	fortis	*fuliginosa*

4.6.4 Classification of living organisms

Question 07 · continued

0 9 . 1 Complete **Figure 15** to give the names of the missing classification groups.

[2 marks]

0 9 . 2 Give the binomial name of the medium ground finch.

Use information from **Figure 15**.

[1 mark]

_____

Question 9 continues on the next page

In each species of finch, there is a variation in beak depth.

Figure 16 shows how beak depth is measured.

Figure 16

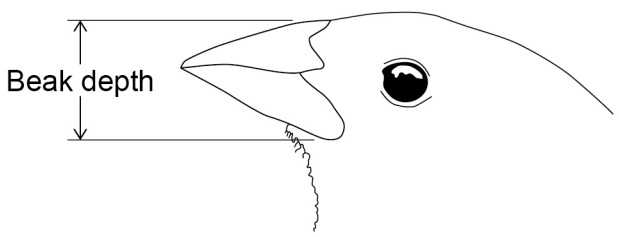
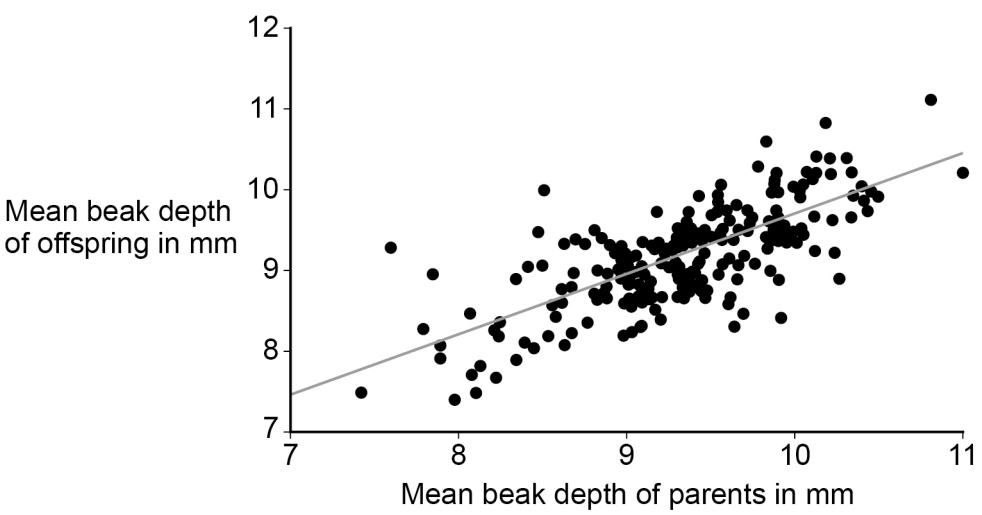


Figure 17 shows the relationship between the beak depth of parent birds and the beak depth of their offspring.

Figure 17



0 9 . 3 Give evidence from **Figure 17** that beak depth is an inherited characteristic.

[1 mark]

4.6.4 Classification of living organisms

Question 07 · continued

0 9 . 4 Scientists suggested that more than one gene controls beak depth.

Give evidence from **Figure 17** to support the scientists' suggestion.

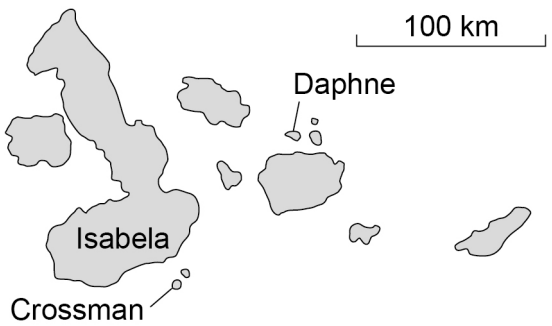
[1 mark]

Question 9 continues on the next page

Question 07 · continued

Figure 18 is a map of the Galapagos Islands.

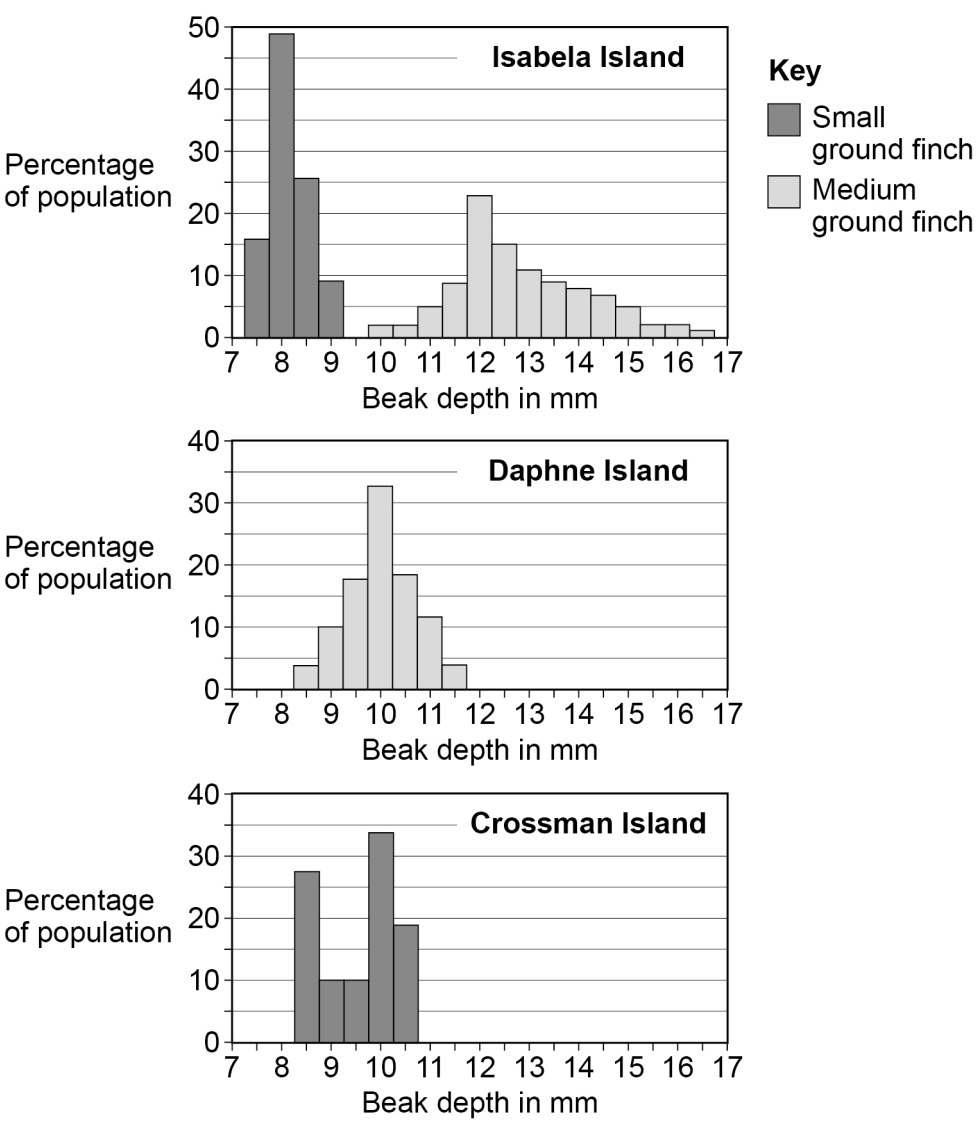
Figure 18



On Isabela Island, the medium ground finch **and** the small ground finch are found.
On Daphne Island, only the medium ground finch is found.
On Crossman Island, only the small ground finch is found.

Figure 19 shows how the beak depth of each species varies on each island.

Figure 19



Question 07 · continued

The medium ground finch and the small ground finch both feed on seeds.

The size of seeds eaten by each bird depends on the depth of the bird's beak.

0 9 . 5 The range of beak depth of **medium ground finches** on Isabela Island is different from the range on Daphne Island.

Explain what might have caused this difference.

[6 marks]

Question 9 continues on the next page

4.6.4 Classification of living organisms

Question 07 · continued

November 2021 | 8461/2H | Original Q9

0 9 . 6 **Figure 19** shows:

- the **two** species of finch live on Isabela Island
- only **one** of the species lives on Daphne Island
- only **one** of the species lives on Crossman Island.

Suggest why both species of finch are able to live on Isabela Island.

[2 marks]

13

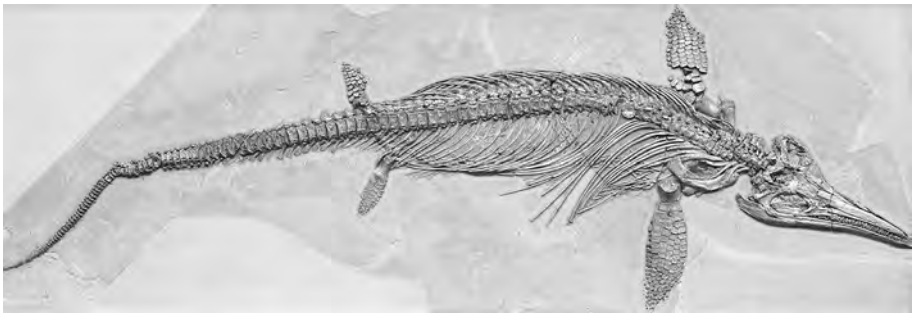
4.6.4 Classification of living organisms

Question 08

0 1 Ichthyosaurs are reptiles that lived in the sea millions of years ago.

Figure 1 shows the fossilised remains of an ichthyosaur.

Figure 1



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

[2 marks]

0 1 . 2 The length of the image of the ichthyosaur in **Figure 1** is 120 mm.

The real length of the ichthyosaur was 17 times longer than the image in **Figure 1**.

Calculate the real length of the ichthyosaur.

Give your answer in metres.

[3 marks]

Real length of ichthyosaur = _____ metres

Question 08 · continued

0 1 . 3 **Table 1** gives the classification of the ichthyosaur in **Figure 1**.

Table 1

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

Complete **Table 1**.

[2 marks]

Choose answers from the box.

Community	Family	Mammal	Phylum	Population

0 1 . 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