



**species questions**

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Date: \_\_\_\_\_

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Time: **28 minutes**

Marks: **28 marks**

Comments:

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**1**

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

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

<b>three billion</b>	<b>three million</b>	<b>three thousand</b>
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Darwin's theory states that life began on Earth .....  
years ago.

**(1)**

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

Complete the sentences.

Changes in genes are called .....

Individuals with characteristics most suited to the environment are more likely

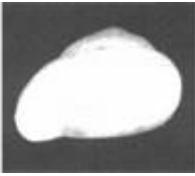
to survive and .....

**(2)**

**(Total 3 marks)**

2

*Cepaea nemoralis* is a snail which is found on sand dunes. It may have a plain or banded shell. The snails are found on grass stalks and leaves.



Plain



Banded

When a scientist collected snails on the sand dunes he got 450 banded  
280 unbanded.

Snails are eaten by birds. Sand dunes have clumps of grasses growing on them.

Suggest why there were more banded than unbanded snails on the sand dunes.

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(Total 4 marks)

3

**Figure 1** is a map showing a group of islands in the Pacific Ocean, near the coast of California, USA.

**Figure 1**



A species of fox, called the Island Fox, lives on each of the six islands shown in **Figure 1**.

**Figure 2** shows an Island Fox.

**Figure 2**



© GaryKavanagh/iStock

The foxes on each island are slightly different from those on the other islands.

The Island Foxes are similar to another species of fox, called the Grey Fox.

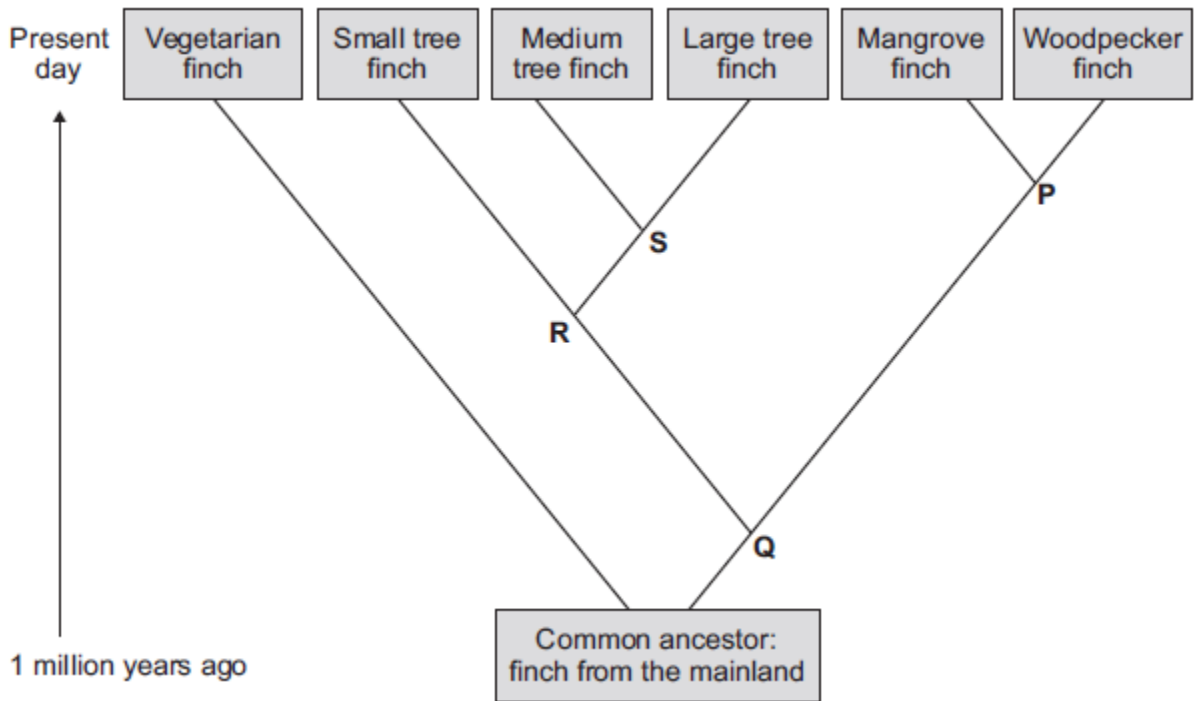
The Grey Fox lives in mainland California.

- (a) Suggest how scientists could prove that the six types of Island Fox belong to the same species.





(c) The diagram below shows the evolutionary tree for some Galapagos finches.



(i) Which type of present-day finch is **least** closely related to all the others?

.....

(1)

(ii) Which branching point, **P, Q, R** or **S**, on the diagram above shows the most recent common ancestor of all the **tree finches**?

Write the correct answer in the box.

(1)

(iii) Which **two** finches have the most recent common ancestor?

1 .....

2 .....

(1)

(Total 9 marks)

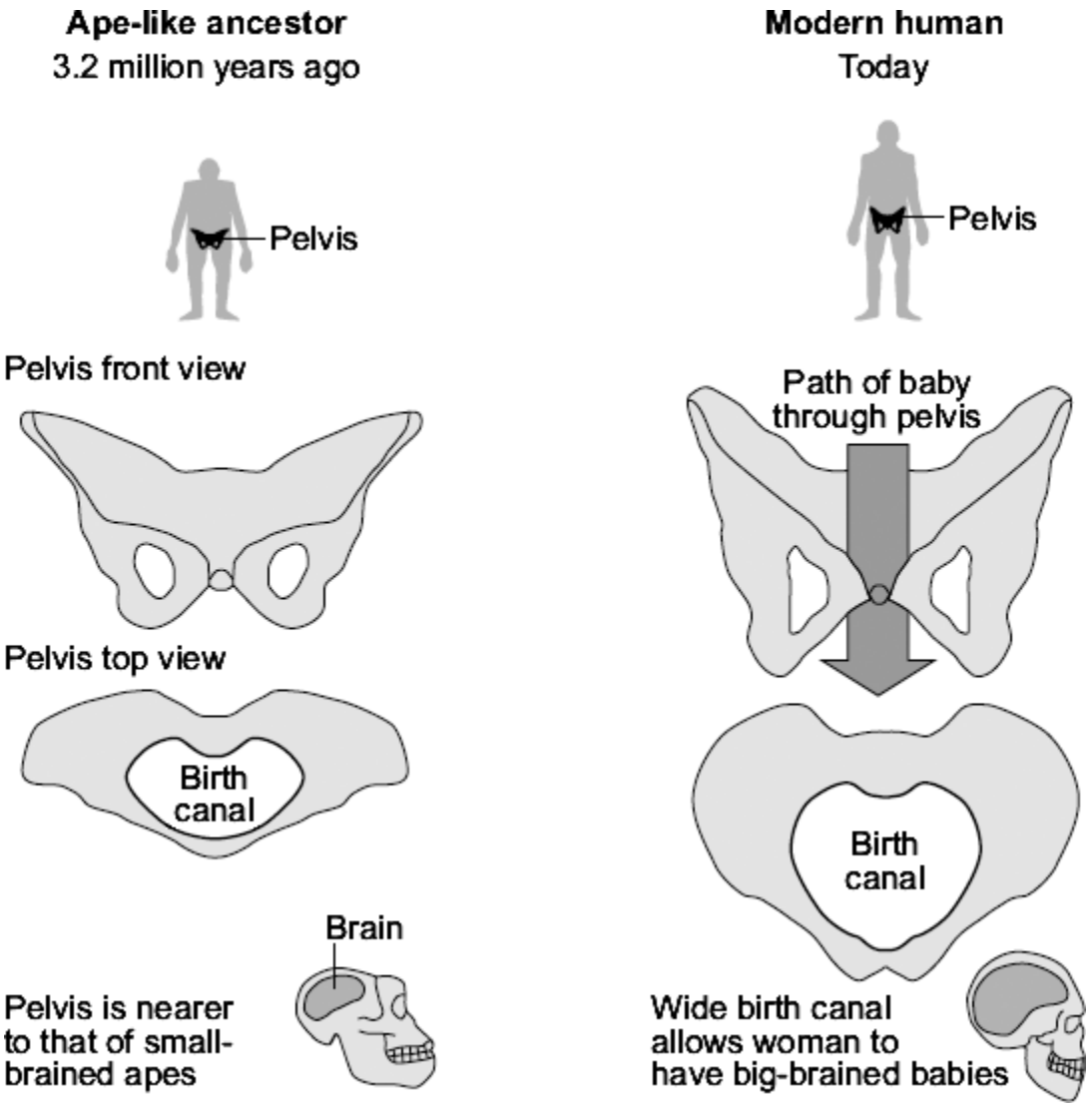
5

Humans have evolved from ape-like ancestors by natural selection.

The drawing shows the pelvis of an ape-like ancestor and a modern human.

The skull and brain of the new born baby are also shown to the same scale.

Modern humans are much more intelligent than their ape-like ancestors.



Suggest an explanation for the evolution of the size and shape of the pelvis of modern humans.

Use information from the drawing to help you.

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.....

**(Total 4 marks)**

## Mark schemes

- 1** (a) three billion 1
- (b) mutation(s) 1
- breed / reproduce  
*in this order only*  
*allow pass on their genes* 1
- [3]**
- 2** *idea*
- banded snails camouflaged/less easily seen
  - fewer banded eaten [by birds]
  - more banded survive to breed
  - more genes for banded passed on  
**or** more banded snails in population  
*for 1 mark each*
- N.B.  
Accept reverse of all above for plain snails  
\*All 4 marks may be gained by a relatively short response
- [4]**
- 3** (a) reference to interbreeding 1
- successfully between Island types  
*allow ref. to production of fertile offspring*  
*allow ref. to DNA analysis / comparison for 1 mark*  
*ignore ref. to grey fox* 1
- (b) (i) (two ancestral populations) separated / isolated (by geographical barrier / sea) 1
- and genetic variation (in each population) **or** different / new alleles **or** mutations occur 1
- under different environment / conditions  
*allow abiotic or biotic example*  
*allow different selection pressures* 1
- natural selection occurs **or** better adapted survived to reproduce 1
- 1

so (favourable) alleles / genes / mutations passed on (in each population)

*ignore they adapt to their environment*

1

(ii) any **one** from:

- continued to mate with one another
- few beneficial mutations (between island varieties)
- similar conditions on each island so similar adaptations/features fit

1

[8]

4

(a) any **two** from:

- most people still believed that God made all the animals / plants on Earth  
*allow against their 'religion'*
- insufficient evidence  
*do not allow no proof / evidence*  
*ignore 'fossil'*
- the mechanism of inheritance / genes unknown (at the time)

2

(b) any **four** from:

- finches separated / isolated
- genetic variation / mutation (in finch population(s))
- finches with alleles / genes best suited to their environment survive  
*Do not allow 'characteristics'*
- advantageous alleles / genes passed on (to offspring)
- after many generations / a long time, the populations can no longer successfully interbreed  
*Ignore 'speciation'*

4

(c) (i) vegetarian finch

1

(ii) **R**

1

(iii) mangrove **and** woodpecker finches

1

[9]

5

a mutation occurs **or** variation in size / shape of pelvis

*allow idea that walking upright needs larger pelvis to bear weight*

1

large / wide birth canal / pelvis allowed passage of wide skull / brain

*do not allow pelvis became larger to enable birth of larger-skulled babies*

1

link between brain size and intelligence

1

those with larger pelvis / brain more likely to survive / reproduce

1

**[4]**