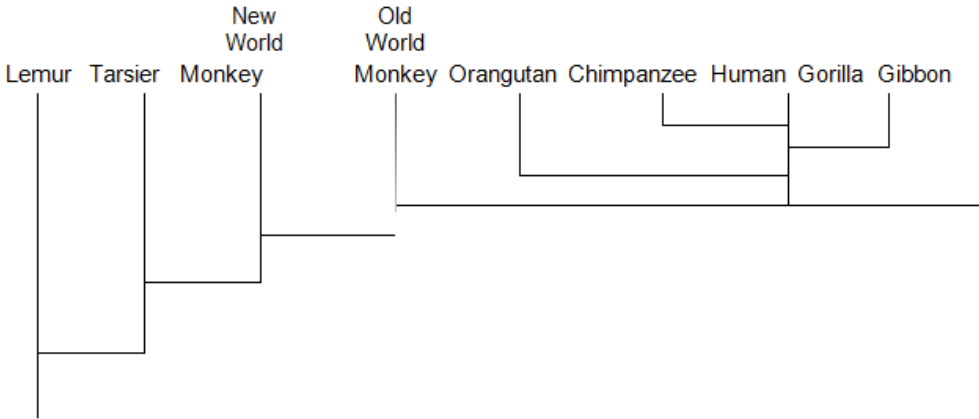


# Evolution 2

Q:1 The diagram shows the evolution of a group called the primates.



(a) Which primate evolved first?

\_\_\_\_\_

(1 mark)

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

1 \_\_\_\_\_

2 \_\_\_\_\_

(2 marks)

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

Which scientist suggested this theory?

\_\_\_\_\_

(1 mark)

(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)

**Q:2** Squirrels live in woodland.

Table 1 shows:

- ☐ the total area of England, Scotland and Wales
- ☐ the area of different types of woodland in these countries.

Country	Total area of country in thousands of km <sup>2</sup>	Area of woodland in thousands of km <sup>2</sup>		
		Coniferous woodland	Broadleaf woodland	Total
England	130	3.6	7.8	11.4
Scotland	79	10.4	3.0	13.4
Wales	21	1.9	0.9	2.8

(a) Look at the data for the three countries. Estimate which country has the greatest proportion of its area suitable as a habitat for squirrels.

Support your answer with relevant figures.

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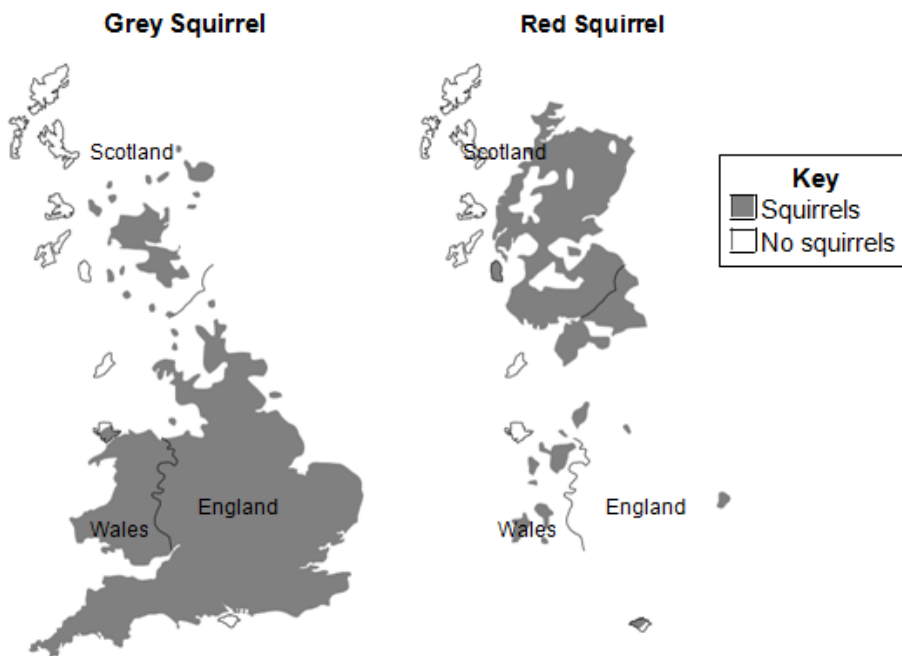
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(2 marks)

(b) The maps show the distribution of grey squirrels and red squirrels in England, Scotland and Wales.



Scientists suggested that the distribution of grey squirrels and red squirrels is linked to the type of trees in woodlands.

**(b) (i)** The information for England and Scotland supports this suggestion.

How?

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**(1 mark)**

**(b) (ii)** Give one piece of evidence that contradicts this suggestion.

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**(1 mark)**

**(c)** Red squirrels are native to the UK.

Grey squirrels were introduced to the UK from the USA over 100 years ago.

Table 2 gives information about the two types of squirrel.

	<b>Grey squirrel</b>	<b>Red squirrel</b>
Population in UK	2.5 million	140 000
Main food types	Seeds, nuts, tree bark, birds' eggs, young birds	Cones from coniferous trees, nuts, tree bark, berries
Health	Can become immune to parapox virus	Cannot become immune to parapox virus
Reproduction	Up to 9 young, twice a year	Up to 6 young, twice a year
Survival rate of young in mixed populations	41 %	14 %
Length of life	2 – 4 years	Up to 7 years

In most parts of the UK the population of grey squirrels is increasing, but the population of red squirrels is decreasing.

Suggest why.

Use information from Table 2.

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**(3 marks)**

**Q:3** Complete the sentences about evolution.

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

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

artificial

natural

asexual

selection.

**(1 mark)**

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

evolved from

artificial

complex

simple

life forms.

**(1 mark)**

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

three billion

three million

three thousand

years ago.

**(1 mark)**

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

Give two reasons why.

1 \_\_\_\_\_

\_\_\_\_\_

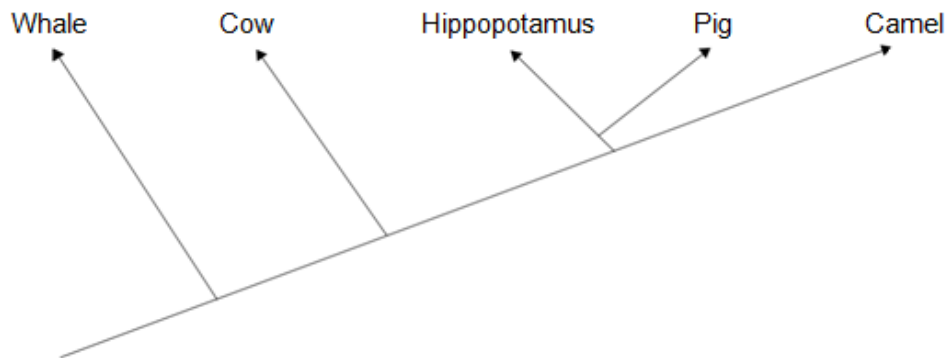
2 \_\_\_\_\_

\_\_\_\_\_

**(2 marks)**

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

Diagram 1



**(c) (i)** Complete the sentence.

The model shown in Diagram 1 is an evolutionary \_\_\_\_\_

**(1 mark)**

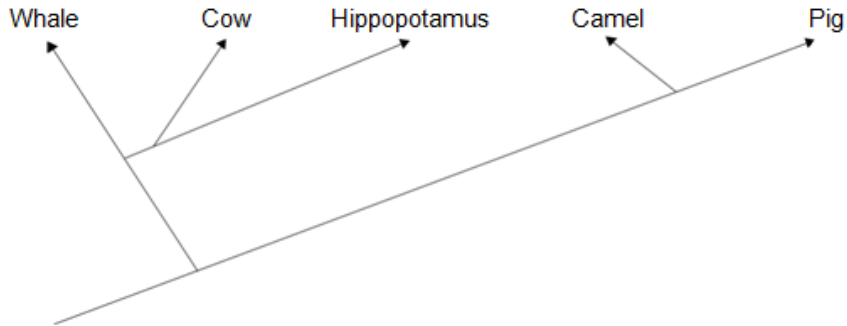
**(c) (ii)** Which two of the animals in Diagram 1 are most closely related?

\_\_\_\_\_ and \_\_\_\_\_

**(1 mark)**

**(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**

**new evidence**

**new species**

**computers**

**from fossils**

**discovered**

**(1 mark)**

**Q:4** Darwin suggested the theory of natural selection.

**(a)** Explain how natural selection occurs.

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**(3 marks)**

**(b)** Latitude is a measure of distance from the Earth's equator.

Scientists investigated the effect of latitude on:

the time taken for new species to evolve

the number of living species.

The table shows the scientists' results.

Latitude in degrees North of equator	Time taken for new species to evolve in millions of years	Relative number of living species
0 (at the equator)	3– 4	100
25	2	80
50	1	30
75 (in the Arctic)	0.5	20

As latitude increases environmental conditions become more severe.

**(b) (i)** Describe the patterns shown by the data.

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**(2 marks)**



(b) (ii) Suggest explanations for the patterns you have described in part (b)(i).

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(2 marks)

Q:5 The drawings show two different species of butterfly.



*Amauris*



*Hypolimnas*

- Both species can be eaten by most birds.
- Amauris has a foul taste which birds do not like, so birds have learned not to prey on it.
- Hypolimnas does not have a foul taste but most birds do not prey on it.

(a) Suggest why most birds do not prey on Hypolimnas.

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(2 marks)

**(b)** Suggest an explanation, in terms of natural selection, for the markings on the wings of Hypolimnas.

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**(3 marks)**

**Q:6(a)** What does the theory of evolution state?

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**(2 marks)**

**(b)** Daphnia are microscopic water fleas. Midge larvae prey on Daphnia. The midge larvae release a hormone into the water. Daphnia respond to these hormones by growing larger protective 'helmet'-like structures.

Scientists were surprised to observe that the offspring of Daphnia females who had been exposed to these hormones always had larger helmets than offspring whose mothers had never been exposed to the hormones. The offspring with the large helmets went on to produce offspring with large helmets.

Explain why the scientists' observations seem to contradict the theory of natural selection.

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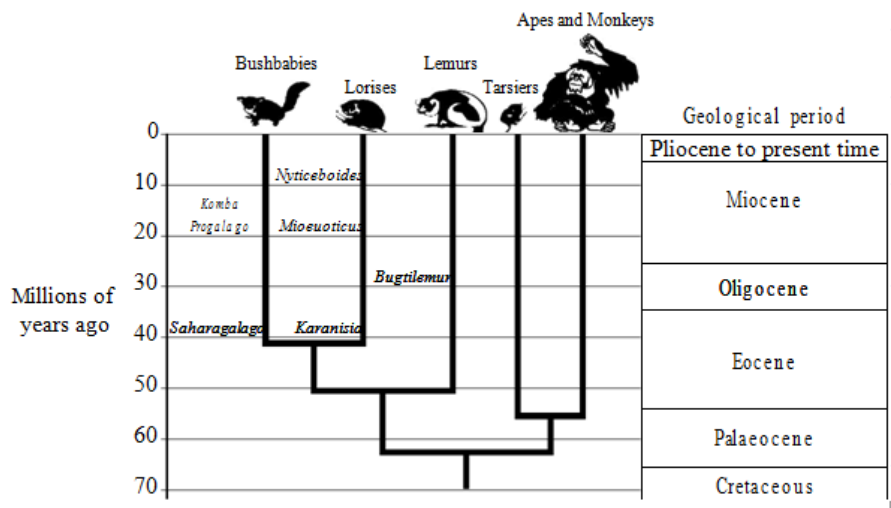


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(2 marks)

**Q:7** 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.



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

\_\_\_\_\_ millions of years ago.

(1 mark)

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

\_\_\_\_\_

(1 mark)

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

\_\_\_\_\_

(1 mark)

**(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)**

**TOTAL MARKS=44**