AQA GCSE Biology | 8461

SPECIFICATION POINT 4.6.4

Classification of living organisms

Mark schemes and examiner comments

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

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.6.4 Classification of living organisms

Answer 01 · Mark scheme

November 2008 | BLY1BP | Original Q8 | Legacy

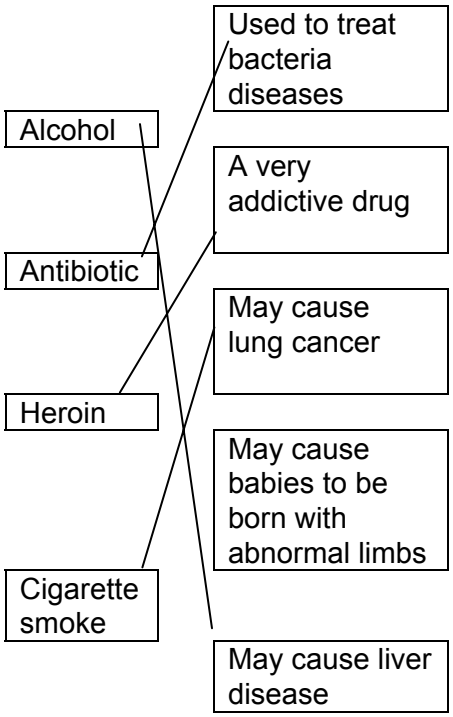
Eight	**1**	**2**	**1**	**2**

4.6.4 Classification of living organisms

Answer 02 · Mark scheme

January 2011 | BLY1F | Original Q3 | Legacy

Question 3

question	answers	extra information	mark
3(a)		**1** mark for each correct line mark each line from left hand box two lines from left hand box cancels mark for that box	4
3(b)(i)	ecstasy		1
3(b)(ii)	(no) any **one** correct difference eg Ecstasy in Class A but least harmful according to scientists	accept reference to figures	1
3(c)	for pleasure		1
Total			**7**

4.6.4 Classification of living organisms

Answer 02 · Mark scheme

January 2011 | BLY1F | Original Q3 | Legacy

BLY1F

4.6.4 Classification of living organisms

Answer 03 · Mark scheme

January 2013 | BL1FP | Original Q5 | Legacy

Question 5

question	answers	extra information	mark
5(a)	mental (illness)	accept specific mental illnesses such as depression, paranoia schizophrenia or dementia allow brain damage do **not** accept cancer	1
5(b)(i)	evidence on graph of attempt to continue line from 2001 to 2014 15	range at 2014 from 13 to 16 inclusive accept any value between 13 and 16 consistent with attempt at straight line if there is no line accept only 15	1 1
5(b)(ii)	no because changing to Class C did not affect trend OR trend / use already falling before the change OR use higher when class B	only award this mark if there is an attempt at an explanation	1 1
Total			**5**

4.6.4 Classification of living organisms

Answer 03 · Mark scheme

January 2013 | BL1FP | Original Q5 | Legacy

BL1FP

4.6.4 Classification of living organisms

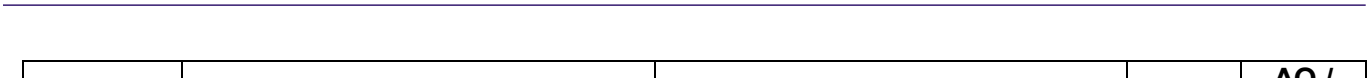
Answer 04 · Mark scheme

Question	Answers	Extra information	Mark	AO / spec ref.
1(a)(i)	Chromosomes		1	AO1 1.7.1b
1(a)(ii)	Characteristics		1	AO1 1.7.1b
1(a)(iii)	Classify		1	AO1 1.8.1d
1(b)	Plants	ignore algae	1	AO1 1.8.1d
Total			4	

4.6.4 Classification of living organisms

Answer 04 · Mark scheme

June 2014 | BL1FP | Original Q1 | Legacy



4.6.4 Classification of living organisms

Answer 05 · Mark scheme

June 2019 | 8461/2F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	Raphus		1	AO2 4.6.4
05.2	any **two** from: • humans hunted / killed / ate the dodo **or** dodo easy to catch • humans ate / collected eggs • humans ate the dodo's food • animals brought by humans ate dodo / eggs • diseases introduced by humans **or** by imported animals • humans destroyed dodo's habitat / nests	allow examples – eg cats / dogs / pigs / rats allow deforestation	2	AO2 4.6.3.6
05.3	any **one** from: • growing crops / biofuels • grazing animals • building houses • quarrying / mining • dumping waste	allow farming / agriculture allow other correct examples – eg building roads	1	AO1 4.7.3.3 4.7.3.4
05.4	there is less photosynthesis the trees are burned		1 1	AO2 4.4.1.1 4.4.1.2 4.7.3.4 4.7.3.5
05.5	increase		1	AO1 4.7.3.5
05.6	9 × 30 270	an answer of 270 scores **2** marks	1 1	AO2 4.7.3.4 4.7.3.6

4.6.4 Classification of living organisms

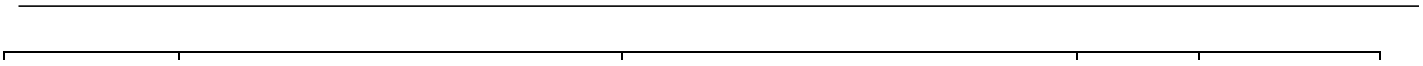
Answer 05 · Mark scheme

Question	Answers	Mark	AO / Spec. Ref.
05.7	**Level 2:** Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	3–4	AO3
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	
	No relevant content	0	
	Indicative content • displaced animals can move to adjacent areas • where suitable habitat is found **or** where the trees have not been cut down • seeds return to deforested area • from other (forested) areas • plants / trees begin to grow back • so provide food / shelter / nest sites / suitable habitat for animals • animals return to re-growing area • from other (forested) areas • sufficient time for regeneration • old growth area is a source of recolonising organisms		4.7.3.1 4.7.3.4 4.7.3.6
Total			**13**

4.6.4 Classification of living organisms

Answer 05 · Mark scheme

June 2019 | 8461/2F | Original Q5



4.6.4 Classification of living organisms

Answer 06 · Mark scheme

November 2020 | 8461/2F | Original Q6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	*Elasmotherium*		1	AO2 4.6.4
06.2	eukaryota		1	AO2 4.6.4
06.3	Carl Woese		1	AO1 4.6.4
06.4	any **one** from: • fighting / competing for mates / food / territory • to kill predators / prey	allow for defence / protection	1	AO2 4.7.1.1 4.7.1.4
6.5	(bones **or** hard tissues) did not decay	allow soft tissues decayed **or** were eaten allow other parts decayed or were eaten allow horn could be damaged / lost in fighting	1	AO1 4.6.3.5
06.6	any **one** from: • compare to other fossils of known age • by the age of the rocks (where fossil was found)	allow compare with the fossil record allow depth underground (where fossil was found) allow (radio)carbon / isotope dating allow DNA analysis	1	AO2 4.6.3.5 4.6.3.6

4.6.4 Classification of living organisms

Answer 06 · Mark scheme

November 2020 | 8461/2F | Original Q6

06.7 mark with 06.8	0.05 (million years ago)		1	AO2 4.6.3.6
06.8 mark with 06.7	0.2 – 0.05 0.15 150 000 (years)	allow 0.05 × 3 allow ecf from question **06.7** allow 0.15 million (years)	1 1 1	AO2 4.6.3.6
06.9	any **two** from: • drought • ice age / global warming • volcanic activity • asteroid / meteor collision • (new) predators • (new) disease • competition for food • competition for mates • lack of habitat **or** habitat change	ignore pollution allow earthquakes / tsunami allow hunters / poachers / eaten allow named pathogen allow lack of food allow isolation **or** lack of mates if no other marks awarded allow natural disaster **or** climate change **or** catastrophic event for **1** mark	2	AO2 4.6.3.6
Total			**12**	

4.6.4 Classification of living organisms

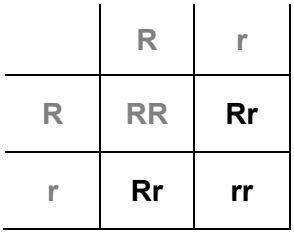
Answer 06 · Mark scheme

November 2020 | 8461/2F | Original Q6

4.6.4 Classification of living organisms

Answer 07 · Mark scheme

November 2021 | 8461/2F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	*Phytophthora*		1	AO2 4.6.4 4.7.5.1
05.2	the fungus can get oxygen from the air		1	AO2 4.4.2.1 4.7.5.1
05.3	the variety of species of organisms in the river		1	AO1 4.7.3.1
05.4	pesticide washed into river pesticide kills (some) organisms / plants / animals in river	allow spray drift allow reference to run-off allow carried by rainfall	1 1	AO2 4.7.3.1 4.7.3.2 4.7.3.6 4.7.5.1
05.5		all 3 correct = **2** marks 2 correct = **1** mark 0 or 1 correct = **0** marks	2	AO2 4.6.1.6 4.7.5.1
05.6	ring drawn around **RR** / **rr** in **Figure 9**	allow around both **RR** and **rr**	1	AO2 4.6.1.6 4.7.5.1
05.7	75%	percentage must match student's answer in **Figure 9** allow 75% if no answer to question **05.5**	1	AO3 4.6.1.6 4.7.5.1

4.6.4 Classification of living organisms

Answer 07 · Mark scheme

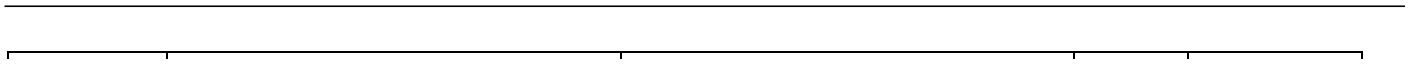
November 2021 | 8461/2F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.8	no fusion of gametes **or** (asexual reproduction involves) mitosis	allow no fertilisation	1	AO2 4.6.1.1 4.6.1.3 4.7.5.1
	(so) offspring are genetically identical (to parent plant)	allow offspring are a clone allow offspring have same DNA allow no mixing of genes / DNA allow no mixing of genetic material allow all offspring inherit **R**	1	
Total			**11**	

4.6.4 Classification of living organisms

Answer 07 · Mark scheme

November 2021 | 8461/2F | Original Q5



Answer 08 · Mark scheme

June 2022 | 8461/2F | Original Q7

Question 7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1 *view with Table 3*	kingdom genus	in this order only	1 1	AO1 4.6.3.5 4.6.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.2	Linnaeus		1	AO1 4.6.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.3	*Elrathia kingii*		1	AO2 4.6.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.4	trilobite **A** was found in older rocks than trilobite **B** trilobite **B** is more complex than trilobite **A**		1 1	AO3 4.6.3.4 4.6.3.5

Answer 08 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.5	sediments soft parts minerals	in this order only	1 1 1	AO2 4.6.3.5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.6	any **three** from: • drought • ice age • global warming • volcanic activity • asteroid collision • (new) predators • (new) disease / pathogen • competition for food • competition for mates • lack of habitat or habitat change	if none of these, allow climate change for **1** mark ignore weather if neither of these, allow catastrophic event **or** natural disaster for **1** mark allow named example allow hunters allow named example allow lack of food allow lack of mates ignore competition unqualified ignore isolation ignore pollution	3	AO1 4.6.3.6

4.6.4 Classification of living organisms

Answer 08 · Mark scheme

June 2022 | 8461/2F | Original Q7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.7	no / insufficient evidence **or** cannot perform experiment to find out	allow lack of evidence allow no-one was there to observe	1	AO3 4.6.3.5 4.6.3.6

Total Question 7		**13**

Answer 09 · Mark scheme

Question 7

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.1	a community		1	AO1 4.7.1.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.2	brambling and chaffinch		1	AO2 4.6.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.3	the brambling and the bullfinch cannot breed together to give fertile offspring		1	AO1 4.6.2.2

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.4		allow answers in terms of month numbers ignore seasons		AO3 4.7.1.1
	constant (from Jan) to Mar / (mid-)Apr	ignore straight	1	
	increases (from mid-)Apr to / and May		1	
	decreases from May / Jun to Dec		1	
		if no other marks awarded allow for **1** mark constant, **then** increase **then** decrease		

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.5	B		1	AO3 4.7.1.1 4.7.1.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.6	D (because) present only May to Sep	allow D (because) present only May to Oct allow D (because) **not** present Oct to Apr / May allow D (because) present only in summer allow D (because) **not** present in winter allow D (because) not present for all the year allow D (because) only present for some of the year	1	AO3 4.7.1.1 4.7.1.4

Total Question 7	**8**

Answer 10 · Mark scheme

June 2024 | 8461/2F | Original Q2

Question 2

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.1	kingdom		1	AO1 4.6.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.2	genus species		1 1	AO1 4.6.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.3	3 million years ago		1	AO3 4.6.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.4	black-backed jackal	ignore jackal do **not** accept golden jackal	1	AO3 4.6.4

Answer 10 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.5	any **two** from: • drought • ice age • global warming • volcanic activity • asteroid collision • (new) predators • (new) disease / pathogen • competition for food • competition for mates • lack of habitat or habitat change	if none of these awarded, allow **1** mark for climate change ignore weather if neither of these, allow catastrophic event **or** natural disaster for **1** mark allow named example allow hunters allow named example allow lack of food allow lack of mates ignore competition unqualified ignore environment change ignore isolation ignore pollution	2	AO1 4.6.3.6

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.6	any **one** from: • wolves ate humans • wolves get left-over food from humans • humans gave food to wolves		1	AO3 4.6.2.3 4.7.1.1

4.6.4 Classification of living organisms

Answer 10 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
02.7	breed the least / less aggressive wolves		1	AO2
	breed (least / less aggressive) offspring	ignore repeat breeding of the original pair(s)	1	AO1 4.6.2.3

Total Question 2	10

Answer 11 · Mark scheme

June 2025 | 8461/2F | Original Q8

Question 8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.1	any **two** from: • (ichthyosaur died and) is buried in sediment / sand / mud / silt • (only) soft parts decayed / eaten **or** bones were not decayed / eaten • bone(s) / remains replaced by minerals	allow skeleton **or** hard parts for bones throughout ignore compression ignore reference to oxygen do **not** accept (icthyosaur died and) is buried in rock(s) allow mineralisation of bones allow bone(s) left imprint in mud / sand / sediment (that then hardened to rock) ignore bones turned to stone / rock	2	AO2 4.6.3.5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.2	120 × 17 2040 (mm) 2.04 (metres)	allow conversion to metres at any stage allow correct conversion of incorrectly calculated length	1 1 1	AO2 4.6.3.5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.3	phylum family	in this order only	1 1	AO1 4.6.3.5 4.6.4

Answer 11 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.4	any **two** from: • ice age • global warming • volcanic activity • asteroid collision • new predators • (new) disease / pathogen • competition for mates • lack of habitat **or** habitat change	 } if neither of these, allow climate change for **1** mark ignore weather } if neither of these, allow catastrophic event **or** natural disaster for **1** mark allow named example allow hunters allow named example allow lack of mates ignore competition unqualified ignore environment change allow competition between **ichthyosaurs** for food ignore isolation ignore pollution ignore lack of food	2	AO1 4.6.3.6

Total Question 8	9

4.6.4 Classification of living organisms

Answer 06 · Examiner comments — November 2020 | 8461/2F | Original Q6

Question 6 (low & standard demand)

This question was about classification, the fossil record and extinction. In **06.5** students often did not make themselves clear when describing the decomposition of various tissues. 'It' or 'they' decomposed were insufficient as the subject of the question was bones. A number of students described the fossils themselves as decomposing. Students did not find **06.6** easy, often just rephrasing the question. A small number suggested the use of carbon dating but the most common correct answers referred to depth or age of the rocks in which the fossils were found as a means of dating them.

06.7 was not well done. Many students were unable to determine the correct time period from the scale on the graph. Some of those who got close to the answer did not realise that the answer line was already primed with 'million' and left their answer as '50 000 million' million. Very few students were able to work out the required answer to **06.8**, despite the mark scheme making allowance for errors from the previous question being carried forward. Many showed numbers in their working which had no evidence of their origin from the graph.

Answer 08 · Examiner comments — June 2022 | 8461/2F | Original Q7

Question 7

This question was about classification, evolution and extinction.

07.1 **Table 3** gave the classification of two species of trilobite with two of the classification groups left blank. Students had to choose the missing groups, *kingdom* and *genus*, from a list of five alternatives. Only a quarter of students chose correctly. 'Community' and 'mammal' proved to be good distractors.

07.2 A similarly small proportion knew that the given classification system was invented by Linnaeus. In fact, 'Darwin' was a more common choice.

07.3 The binomial name of trilobite **A** should have been relatively easy to deduce from **Table 3** but *Elrathia kingii* was the *least* common option selected from the three given alternatives.

4.6.4 Classification of living organisms

Answer 08 · Examiner comments June 2022 | 8461/2F | Original Q7

07.4 The correct two pieces of evidence in support of the scientist's hypothesis that trilobite **B** may have evolved from trilobite **A** were that **A** was found in older rocks and that **B** was the more complex of the two. Almost 40 percent of students ticked both these options, but the idea that both were found in the same type of rock, although incorrect, was commonly selected.

07.5 Completion of the three sentences to describe fossilisation, using words from the box, proved challenging for many with only one in eight getting all three correct.

07.6 Considering the number of times that causes of extinction have been asked for in previous examination years, performance here was not as strong as might have been expected. However those who gained marks often referred to climate change or global warming, predators and the lack of food. Common insufficient answers included 'changes' in temperature (which happen by the hour) and unsuitable 'weather' or 'environmental change', each of which is too vague. Fewer than one quarter were able to give three suitable suggestions.

07.7 A lack of evidence or that nobody was there at the time were each given frequently as a suggestion for why scientists cannot be sure of the cause of extinction of the trilobites. Weaker students got no further than saying that it was a 'long time ago' or that there are 'many ways to become extinct'. Only just over one third gained credit.

4.6.4 Classification of living organisms

Answer 09 · Examiner comments

June 2023 | 8461/2F | Original Q7

Question 7

This was the first of three questions common to both the Foundation and Higher Tier papers. It was about different species of bird living in the same habitat

07.1 Just over a quarter of students selected the term community for describing all of the organisms living in the same habitat. Ecosystem was a very strong distracter and was selected by twice as many as those who chose the correct answer.

07.2 Nearly all students selected the pair of birds with a common generic name, the brambling and the chaffinch, as those being most closely related.

07.3 The fact that the two species named in the question could not breed together to give fertile offspring was recognised by just over half as the criterion for them being different species.

07.4 In this question, students had to describe one of the patterns from the graph showing how the number of birds of four species varied throughout one year. Students were expected to make reference to the months given on the horizontal axis. A suitable answer included the number being constant from January to April, then increasing during April and May and finally decreasing over the remainder of the year. Many answers were less precise and fewer than one-fifth gained all 3 marks, although a similar proportion of the students gave at least two valid points.

07.5 Half of the students were able to select species B as the one with the lowest resistance to the disease as its numbers fell the most during the given months of June and July.

07.6 In this question, students had to decide which species migrated between the UK and other countries, giving the reason for their choice. Around one-third correctly selected species D, giving its presence on the graph only between May and September (or being present only in the summer, or absent the rest of the year) as their reason.

Answer 10 · Examiner comments June 2024 | 8461/2F | Original Q2

Question 2 (low demand)

02.1 Almost 65% of students knew that balance is the function of the cerebellum.

02.2 A third of students were able to identify both classification groups that form the binomial name. However, a further 50% of students could identify at least one. It was common to see only one box ticked in this question; students are reminded to read the instructions given in the question carefully.

02.3 Almost 80% of students identified the correct time as 3 million years ago.

02.4 Just under two thirds of students gained this mark.

02.5 Almost half of students could give two possible causes of extinction, with a further one third of students able to give at least one. The most common causes given were predators and lack of food. A noticeable number of students failed to gain credit by only giving a vague statement about environment change.

02.6 25% of students could suggest a correct reason as to why wolves began to follow humans, with lots of vague statements about the similarities between wolves and humans in terms of what they ate and how they hunted.

02.7 Over half of students did not gain any credit on this question. Most commonly a student that gained one mark did so by describing the breeding of two less aggressive wolves but did not go further to describe breeding the offspring to achieve the second mark.

Answer 11 · Examiner comments June 2025 | 8461/2F | Original Q8

Question 8 (Standard demand)

08.1
This question required students to apply their knowledge of fossil formation to the specific example of an ichthyosaur fossil.
Only two steps in the fossilisation process were required to score full marks, so misunderstanding or omission of one step, was not critical. Only 7% of students achieved the full 2 marks, with 60% scoring no marks or not attempting the question.
Students that gained credit often did so for showing an understanding of the first step in fossil formation, by referring to sediment, or an appropriate synonym. However, several also referred to the dead animal being buried in 'rock' or in 'rocks' which disqualified this idea. Whether this burying occurred before or after decay was not important in the award of the mark.
Although some students were aware that the dead ichthyosaur had decayed, they were often imprecise in terms of what had decayed. Some described the whole 'body' or the 'tissues' decaying, which implied that both soft and hard material decays. Very few students referred to the soft tissues being eaten (by detritivores).

4.6.4 Classification of living organisms

Answer 11 · Examiner comments

June 2025 | 8461/2F | Original Q8

08.2

Students were provided with the length of the fossil image and the relevant magnification factor and were required to calculate the real length of the fossil.

Many students completed this calculation well with 40% gaining all 3 available marks. The most common error was in converting millimetres to metres, where a conversion factor of 100 was not uncommon. Some students completed the conversion in two steps, first converting to centimetres, then to millimetres, perhaps showing a lack of confidence.

A not uncommon error was for students to use the magnification equation, with the two values as numerator and denominator. It was rare then, for students to attempt to convert their answer to metres.

08.3

Students were required to recall the classification hierarchy, completing a partial classification using given terms.

This was very well attempted with over half of students gaining at least 1 mark. It was clear that many students had remembered the sequence by using a mnemonic. However, many students confused population for phylum, presumably due to the same initial letter.

08.4

Students were required to suggest causes for the extinction of ichthyosaurs, and over 50% of students gained at least one of the available 2 marks.

Although this should not be an unfamiliar question to students who have practised from previous examination papers, the context of the information provided meant that some general answers were insufficient. The information in the question was that ichthyosaurs lived in the sea, consequently 'drought' was not credited. Similarly, the information provided stated that ichthyosaurs were in competition with other predators for food, thus a 'lack of food' was ignored, as was the presence of 'predators'. For this last idea, a mark could only be awarded if any predators were described as being 'new'.

Common correct responses included reference to 'disease' and 'habitat loss', although all of the possible answers were seen.