AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.7.3.4

Deforestation

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**4**
Available paper years	**2019–2025**

Using this booklet

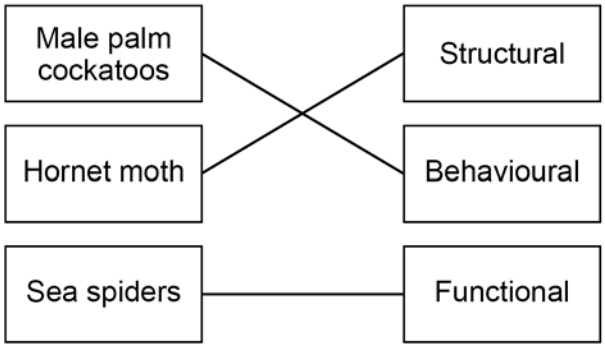
1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

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.

4.7.3.4 Deforestation

Answer 01 · Mark scheme June 2019 | 8464/B/2F | Original Q3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	 additional lines from a box on the left negates the mark for that box 3 lines correct for **2** marks 1 **or** 2 lines correct for **1** mark		2	AO2 4.7.1.4
03.2	brightly coloured flowers large quantities of pollen		1 1	AO2 4.6.2.2 4.7.1.1 4.7.1.4
03.3	biodiversity		1	AO1 4.7.3.1
03.4	any **one** from: • to grow crops • to raise cows • to build	allow farming / biofuels or named crop allow houses **or** building materials allow mining allow paper / fuel	1	AO1 4.7.3.4
03.5	any **one** from: • (new) disease • (new) herbivore • climate change **or** global warming **or** ice age • volcano / earthquake / tsunami / meteor • lack of pollinators • (new) competitor	ignore (new) predator allow drought / flooding allow plant collectors	1	AO1 4.6.3.3
03.6	DNA	allow deoxyribonucleic acid	1	AO1 4.6.1.3
03.7	genome		1	AO1 4.6.1.3
Total			**9**	

4.7.3.4 Deforestation

Answer 01 · Mark scheme

June 2019 | 8464/B/2F | Original Q3

4.7.3.4 Deforestation

Answer 02 · Mark scheme November 2020 | 8464/B/2F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	plant hedgerows around his fields plant many different crops in his fields		1 1	AO3 4.7.3.6
05.2	any **one** from: • repeat in each area • do more quadrats (to take more readings) • count the number of individuals of each species • remove leaf litter and search in tray • do a timed search of the leaf litter • do on the same day or time of day		1	AO3 4.7.2.1 RPA 7
05.3	the trees provide habitat(s) or shelter so (more) food / camouflage / shade available	allow described allow places to hide or cooler or wetter environment	1 1	AO2 4.7.2.1 RPA 7
05.4	ring drawn around 20		1	AO3 4.7.2.1 RPA 7
05.5	(removing trees) decreases the number of invertebrate species		1	AO3 4.7.2.1 RPA 7

4.7.3.4 Deforestation

Answer 02 · Mark scheme

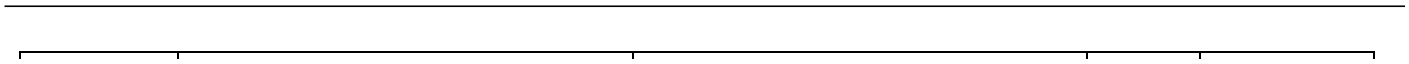
November 2020 | 8464/B/2F | Original Q5

05.6	(less trees means) more light (and) more water / minerals in soil (so) reduced competition **OR** (less trees means) more light (1) (so) (more) photosynthesis (1) (so) (more) glucose (for growth) (1)		1 1 1	AO2 4.7.1.2 4.4.1.1 4.4.1.3
Total			**10**	

4.7.3.4 Deforestation

Answer 02 · Mark scheme

November 2020 | 8464/B/2F | Original Q5



4.7.3.4 Deforestation

Answer 03 · Mark scheme

November 2021 | 8464/B/2F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	any **one** from: • less / decreased / reduced photosynthesis • (more) burning / combustion (of wood) • decomposition / decay (of wood)	allow burning / combustion (of fossil fuel in machinery)	1	AO1 4.7.3.4
05.2	methane	allow water (vapour) allow other correct greenhouse gases eg nitrous oxide(s), nitrogen oxide, ozone, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride	1	AO1 4.7.3.5
05.3	any **two** from: • respiration (by animals) • fuel burnt / used for transport • fuel burnt / used to heat / light buildings (in intensive farming) • fuel burnt / used to process / cook (meat)	ignore burning / combustion unqualified	2	AO2 4.7.3.5 4.7.3.4 4.7.2.2

4.7.3.4 Deforestation

Answer 03 · Mark scheme

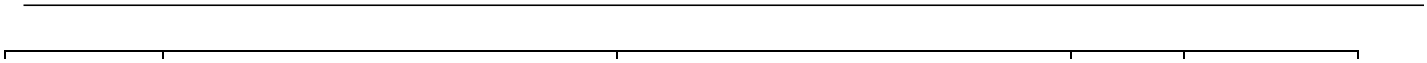
November 2021 | 8464/B/2F | Original Q5

Question	Answers	Mark	AO / Spec. Ref.
05.4	**Level 2:** Scientifically relevant features are identified; the way(s) in which they are similar / different is made clear and (where appropriate) the magnitude of the similarity / difference is noted.	3–4	AO3 4.7.3.5
	Level 1: Relevant features are identified and differences noted.	1–2	
	No relevant content	0	
	Indicative content General • all diets cause carbon dioxide to be released Typical diet • releases more carbon dioxide than diet A **and** B • releases 750 (kg per person per year) more carbon dioxide than diet A • releases 1750 (kg per person per year) more carbon dioxide than diet B Diet A • releases less carbon dioxide than typical diet • releases more carbon dioxide than diet B • releases 1000 (kg per person per year) more carbon dioxide than diet B comparisons can be given in terms of correct data or calculations or proportions for example, typical diet releases 8 times more carbon dioxide than diet B For **Level 2** both comparison of all three diets **and** quoting data or calculation are required.		
Total		**8**	

4.7.3.4 Deforestation

Answer 03 · Mark scheme

November 2021 | 8464/B/2F | Original Q5

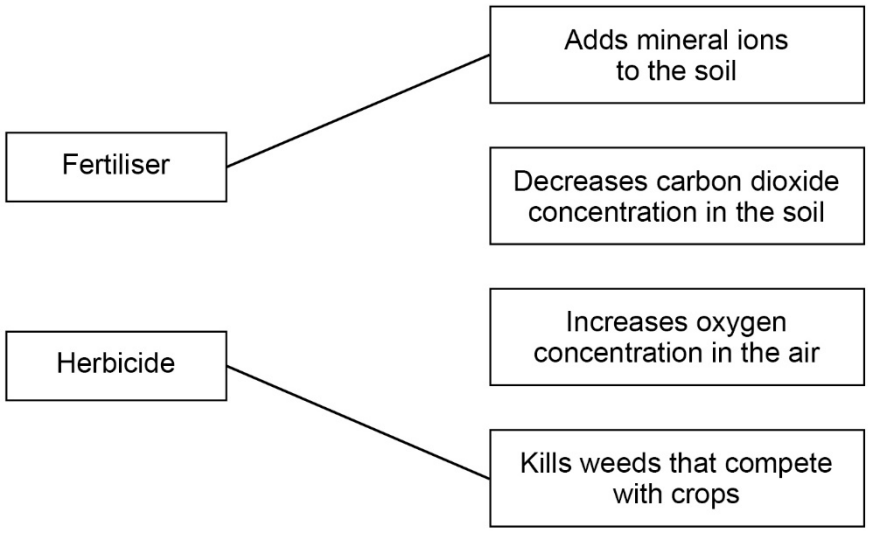


4.7.3.4 Deforestation

Answer 04 · Mark scheme

June 2025 | 8464/B/2F | Original Q2

Question 2

Question	Answers	Mark	AO / Spec. Ref.
02.1	 do **not** accept more than one line from a box on the left	1 1	AO1 4.7.1.1 4.7.1.2 4.7.3.2 4.6.2.4 4.7.3.3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.2	owls		1	AO2 4.7.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.3	insects eat pests on the crop insects pollinate the crop		1 1	AO2 4.7.1.1 4.7.2.1

4.7.3.4 Deforestation

Answer 04 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.4	any **one** from: • as a habitat for (beneficial) insects / animals • to keep (larger) animals out **or** to keep people out • (to increase) biodiversity • to reduce wind speed • as a habitat for predators of crop damaging organisms • to prevent / reduce soil erosion	allow as a shelter / space for (beneficial) insects / animals allow to protect (the crop) from (larger) animals allow to protect (the crop) from people ignore keep insects / birds out ignore to protect the crop unqualified ignore to stop pests eating the crop allow to increase the number of insects / plants allow descriptions of increasing biodiversity allow act as wind break ignore to reduce pests unqualified ignore so more (crop) can be grown	1	AO2 4.7.3.6 4.7.3.1 4.7.1.1

4.7.3.4 Deforestation

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.5		allow converse if clearly referring to soil		
	water takes more time to drain (through)	allow there will be more water (in the peat compost) allow water drains / moves slow**er** allow water drains / moves more slowly ignore water drains slow / slowly	1	AO3 4.7.3.3
	(so) water is more likely to be taken up by plants **or** (so) do not need to water plants (as) frequently **or** (which is an advantage because) young plants cannot reach water that is deep (in soil / compost)	allow (so) there is more time for plants to take up water allow (so) reduces water use ignore references to cost allow **2** marks for water more likely to be taken up by plants before it drains away	1	

4.7.3.4 Deforestation

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.6	(A) respiration (B) photosynthesis	answer line takes precedence	1 1	AO1 4.7.2.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.7	(burning peat) releases / increases carbon dioxide (which) causes / increases global warming	allow (burning peat) releases / increases CO_2 ignore burning releases carbon do **not** accept peat contains carbon dioxide allow (which) is a greenhouse gas allow (which) causes the greenhouse effect ignore (which) causes / increases climate change	1 1	AO1 4.7.2.2 4.7.3.3 4.7.3.5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.8	bacteria fungi		1 1	AO1 4.7.2.2 4.7.3.3

4.7.3.4 Deforestation

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.9	farming (cattle / biofuel / crops / animals)	allow examples of farming a crop / animal allow building allow named type of building eg houses / factories allow mining allow landfill allow reforestation / rewilding	1	AO1 4.7.3.4

Total Question 2	**15**

4.7.3.4 Deforestation

Answer 03 · Examiner comments November 2021 | 8464/B/2F | Original Q5

Question 5 (low & standard demand)

Few students could give one way that deforestation can increase carbon dioxide levels in the atmosphere. Methane was the most common correct answer given to **05.2**. Common incorrect responses included nitrogen, oxygen and hydrogen.

Students found it difficult to give two ways the production of meat releases carbon dioxide. The most common correct answer referred to fuel used to cook meat. Respiration of the animals was not a common response. Frequent misconceptions were that the animals release carbon dioxide when they are killed or cut open. Some responses were too vague at this level, therefore 'transport' was insufficient, but 'fuel is burnt or used to transport the animals/meat' was acceptable.

In **05.4** students were expected to compare the carbon dioxide released during the production of all three diets and use data from the graph. Students who did not compare all three diets and use the data could not access level 2 (for 3 or 4 marks). Responses that indicated only which diet released most or least carbon dioxide during production generally only gained 1 mark. If all three diets were compared and correct calculations of the differences from the graph were given, then 4 marks was awarded.

4.7.3.4 Deforestation

Answer 04 · Examiner comments

June 2025 | 8464/B/2F | Original Q2

Question 2 (Low and Standard demand)

02.1 The correct role of fertiliser was seen more frequently than that of herbicide, but many students did not seem familiar with either term.

02.2 Fewer than half of students could identify the secondary consumer in the food chain. 'Mice' was the most commonly selected answer, presumably with students focussing on the 'secondary' rather than understanding the term 'secondary consumer'.

02.3 Most often, students could identify that insects pollinating the crop would increase yield, but fewer students realised that insects eating pests on the crop would also increase crop yield.

02.4 Many students gave a correct suggestion about why farmers increase the size of hedgerows. Most frequently this was the idea of keeping animals or people out or increasing the number of insects. Reponses suggesting that this gives more space for crops to grow was a frequent misconception, along with incorrect ideas of what hedges are and how much of a barrier they represent, for example, preventing insects passing through or preventing the spread of disease. Some students mistakenly thought hedgerows would keep birds out. Overall, there was a lack of appreciation for the role of hedgerows in increasing biodiversity.

02.5 Student can never be given credit to repeating information in the question, so statements such as 'the water drains slow' could not be awarded mark point 1. If students went a little further to state that 'the water drains more slowly', the response was then comparative and the mark could be awarded.

Peat comes from peat bogs.

0 2 . 5 Peat can be used to produce garden compost.

Table 1 compares peat compost with a sample of soil.

Table 1

	Mineral ion concentration	Speed at which water drains through
Peat compost	Low	Slow
Soil	High	Fast

Young plants have short roots.

Explain **one** advantage of growing young plants in peat compost instead of in soil.

[2 marks]

They have a low mineral ion concentration
A slow speed at which water drains
through.

This student has not added any information that is not taken directly from Table 1, therefore no marks could be awarded. If the student had stated 'A slower speed at which water drains through' then the mark would be awarded for that comparative response.

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4.7.3.4 Deforestation

Answer 04 · Examiner comments June 2025 | 8464/B/2F | Original Q2

02.6 **‘**Transpiration’ was frequently given as an incorrect answer. Presumably because students are more familiar with plants transpiring, than with plants respiring.

02.7 Students were provided with the information that peat contains carbon compounds and that burning peat contributes to climate change. Therefore, neither of those ideas could be awarded credit. The most common response that did not gain credit was that ‘burning peat releases carbon and contributes to climate change’. Some students were incorrectly linking carbon dioxide with the ozone layer.

02.8 Nearly 50% of students could identify that both bacteria and fungi cause decay. The most common incorrect answer was ‘algae’.

02.9 The wide mark scheme indicates the many and varied ways that students could answer this question. All the ideas on the mark scheme were seen. When the mark was not awarded, this was usually because students had not read or understood the question and they responded in terms of ‘fewer trees giving out oxygen’.