AQA GCSE Biology | 8461

SPECIFICATION POINT 4.7.5.3

Sustainable fisheries

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**7**
Available paper years	**2007–2021**

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.

4.7.5.3 Sustainable fisheries

Answer 01 · Mark scheme

June 2007 | BLY1F | Original Q7 | Legacy

The full source mark scheme begins on page 17. Follow original question 7 in that document.

4.7.5.3 Sustainable fisheries

Answer 02 · Mark scheme

Question 6

question	answers	extra information	mark
6(a)	three layer triangular pyramid soya / beans / food – trout / fish – people / human (in sequence)	either way up (as blocks or triangle) ignore reference to producers / herbivores / consumers award **1** mark only for a correct food chain with 2 correct arrows showing energy flow	1 1
6(b)	the trout release energy when they respire some energy will be lost in waste from the trout		1 1
6(c)	any **one** from eg • easy / easier to catch / more caught • easy / easier to feed • no / less predation • less energy loss • less movement	 allow easy / easier to monitor allow control food allow less fishing / poaching allow grow faster ignore less space to move do **not** allow easier to farm	1
6(d)	any **two** from: • microorganisms / bacteria / decomposers / microbes / fungi / detritus feeders • decay / rot / decompose / digest / break down • (microorganisms) respire • turned into fossil fuels / named fossil fuels • carbon dioxide / CO_2 released	 ignore biodegrade do **not** award this mark if response implies the trout respire	2
Total			**7**

4.7.5.3 Sustainable fisheries

Answer 02 · Mark scheme

January 2010 | BLY2F | Original Q6 | Legacy

BLY2F

4.7.5.3 Sustainable fisheries

Answer 03 · Mark scheme

June 2013 | BL3FP | Original Q6 | Legacy

Question 6

question	answers	extra information	mark
6(a)	C		1
6(b)	otherwise species may disappear altogether	allow to avoid extinction	1
6(c)	any **two** from: • regulate net size • impose fishing quotas • limit fishing during breeding seasons • bans on discarding of fish • bans on fishing in certain areas	if mesh size specified, must be larger	2
Total			**4**

4.7.5.3 Sustainable fisheries

Answer 04 · Mark scheme June 2014 | BL3FP | Original Q6 | Legacy

Question	Answers	Extra information	Mark	AO / spec ref.
6(a)(i)	76.0 / 76	correct answer with or without working gains 2 marks allow 76.04 for 2 marks allow 76.04 with extra decimal places eg 76.042 for 1 mark $\frac{465}{611.5}$ for 1 mark	2	AO2 3.4.4c
6(a)(ii)	mass of fish declines (until 2008) (due to an) increase in fishing / overfishing and then rises (until 2010) (which could be due to) quotas / net restrictions working	ignore use of numbers allow number of fish decline (until 2008) allow any reasonable suggestion, such as countries swapping quotas or restrictions on fishing during breeding seasons ignore less fishing if no other marks awarded allow 1 mark for a decrease in mass **and** an increase in mass if answer relates to sustainable fishing	1 1 1 1	AO2 / AO3 3.4.4c
6(a)(iii)	(this is due to) public awareness / demand	allow legislation / rules	1	AO3 3.4.4c
6(b)	fishing quotas / bans (small) net / mesh size	 if size of net is stated then it must be smaller if size of mesh is stated then it must be larger	1 1	AO1 3.4.4c

4.7.5.3 Sustainable fisheries

Answer 04 · Mark scheme

6(c)	(fish) cannot move freely / as much		1	AO1 / AO2 3.4.4b
	(therefore) less <u>energy</u> loss from the fish	do **not** allow 'no energy is lost' ignore references to less heat loss though controlling body temperature ignore references to respiration	1	
	(there is) more food available / better quality food / fed more often	accept 'high-protein food (for making cells)'	1	
	(so) there is more energy for growth **or** (more food) is converted to biomass		1	
Total			13	

4.7.5.3 Sustainable fisheries

Answer 04 · Mark scheme

June 2014 | BL3FP | Original Q6 | Legacy

Question	Answers	Extra information	Mark	AO / spec ref.

4.7.5.3 Sustainable fisheries

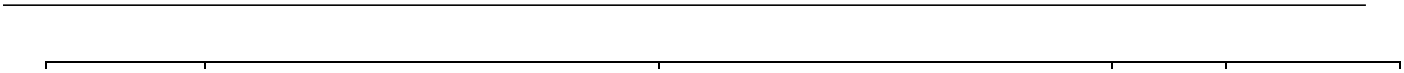
Answer 05 · Mark scheme June 2016 | BL3FP | Original Q5 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
5(a)(i)	any **three** from: • lights to help guide / attract fish (to the holes) • (rigid so) holes stay open • (holes) allow small / young fish to escape • (so that) they can breed		3	AO2/3 3.4.4c
5(a)(ii)	(fishing) quotas / legislation		1	AO1 3.4.4c
5(b)(i)	movement is restricted (in a building **or** close together so) heat is conserved	 allow in heated buildings to reduce heat loss	1 1	AO2 3.4.4b
5(b)(ii)	any **two** from: • it is cruel • disease spreads faster • (meat) often has antibiotics in it	allow descriptions of ‘cruelty’	2	AO3 3.4.4b
Total			**8**	

4.7.5.3 Sustainable fisheries

Answer 05 · Mark scheme

June 2016 | BL3FP | Original Q5 | Legacy



4.7.5.3 Sustainable fisheries

Answer 06 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.1	$\frac{6.0}{1.6}$ 3.75	allow a range of 5.9 to 6.1 for 6.0 do **not** accept if a unit is given if no other marks awarded, allow a correct answer using a value of 5.8 or 6.2 for **1** mark	1 1	AO2 4.7.3.2
09.2	$\frac{2.5 - 1.6}{50}$ 0.018 (billion per year)	allow $\frac{0.9}{50}$	1 1	AO2 4.7.3.2
09.3 view with Figure 12	suitable extrapolation line on Figure **2** reading taken at 2050 from student's line	allow straight extrapolation allow a tolerance of ± ½ small square allow **1** mark for 10 billion if no extrapolation drawn	1 1	AO2 4.7.3.2
09.4	fewer fish caught **or** limit the number of fish caught (remaining fish) can reproduce	allow a method of doing this, eg increase mesh size **or** do not catch young fish allow more fish (survive to) reproduce	1 1	AO1 4.7.5.1 4.7.5.3

4.7.5.3 Sustainable fisheries

Answer 06 · Mark scheme

Question	Answers	Mark	AO / Spec. Ref.
09.5	**Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	4-6	AO1 4.7.3.1 4.7.3.2 4.7.3.3 4.7.3.4 4.7.3.6 4.7.3.5 4.7.5.1 4.7.5.2
	Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.	1–3	
	No relevant content	0	
	Indicative content **human land use** • increasing population requires more food • crops / livestock for food • farming crops for biofuels • peat use as compost • peat use as fuel • increased use of pesticide / insecticide / herbicide / fertilisers • use of free-range / organic methods increases land use (for same yield) **link to biodiversity** • deforestation • monocultures • loss of hedgerows to make fields larger • loss of habitat • consequence of loss of habitat eg (change in) migration • fertiliser run off polluting water • use of pesticide / insecticide / herbicide reduces insects / plants which damages food chains • more soil erosion **link to atmospheric pollution** • more carbon dioxide (from farm animals / machinery) • more methane (from cows) • climate change **or** global warming • example of impact on biodiversity • acid rain • desertification Answers referring to only land use or only biodiversity are level 1		

4.7.5.3 Sustainable fisheries

Answer 06 · Mark scheme

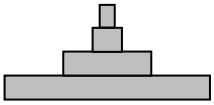
November 2020 | 8461/2F | Original Q9

09.6	golden rice has improved nutritional value		1	AO1 4.7.5.4
09.7	any **one** from: • gene may contaminate / enter other breeds / species • reduction / extinction of population of wild / traditional rice • reduction / extinction of population of flowers / insects • high cost of seeds • may have too much vitamin A (in diet)	ignore references to religious beliefs allow decrease in biodiversity allow decrease in gene pool allow may harm (human) health allow may cause side effects (on humans) ignore may harm humans unqualified	1	AO3 4.6.2.4
Total			**16**	

4.7.5.3 Sustainable fisheries

Answer 07 · Mark scheme

November 2021 | 8461/2F | Original Q3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	carbon dioxide water		1 1	AO1 4.7.2.2 4.4.1.1
03.2	light		1	AO1 4.7.4.3 4.4.1.1
03.3			1	AO3 4.7.4.2
03.4	 2.3 **and** 0.5 $\frac{(2.3 - 0.5)}{2.3} \times 100$ **or** $\frac{1.8}{2.3} \times 100$ 78.2(6087....) 78	allow figures in millions allow in range 2.25 to 2.3 for 2.3 allow in range 0.5 to 0.55 for 0.5 allow correct substitution of student's incorrect graph readings allow correct answer from student's substitution of incorrect graph readings ignore incorrect rounding allow correct rounding of calculated value	 1 1 1 1	AO2 4.7.5.3
03.5	increase (in biomass of herring) from 0.1 to 1.8 (million tonnes) **or** change of 1.7 (million tonnes) **or** change of 1700%	 allow a tolerance of ± ½ small square for graph readings	1 1	AO3 AO2 4.7.5.3

4.7.5.3 Sustainable fisheries

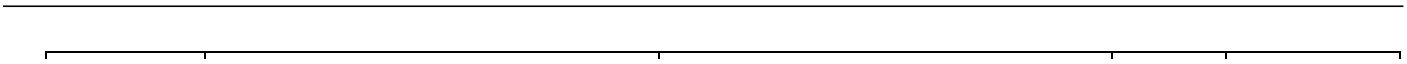
Answer 07 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.6	smaller / 4-yr-old fish not caught	allow younger fish not caught allow (only) older fish caught	1	AO3 4.7.5.3
	(so) escaping fish can reproduce	allow so younger fish can survive to reproduce	1	
Total			12	

4.7.5.3 Sustainable fisheries

Answer 07 · Mark scheme

November 2021 | 8461/2F | Original Q3



4.7.5.3 Sustainable fisheries

Version 1.0: 0707

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Science B 4462 / Biology 4411

BLY1F Unit Biology 1

Mark Scheme

2007 examination - June series

4.7.5.3 Sustainable fisheries

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available to download from the AQA Website: www.aqa.org.uk

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Dr Michael Cresswell, Director General.

4.7.5.3 Sustainable fisheries

MARK SCHEME

Information to Examiners

1. General

The mark scheme for each question shows:

- the marks available for each part of the question
- the total marks available for the question
- the typical answer or answers which are expected
- extra information to help the Examiner make his or her judgement and help to delineate what is acceptable or not worthy of credit or, in discursive answers, to give an overview of the area in which a mark or marks may be awarded.

The extra information is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme.

At the beginning of a part of a question a reminder may be given, for example: where consequential marking needs to be considered in a calculation; or the answer may be on the diagram or at a different place on the script.

In general the right hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent.

2. Emboldening

2.1 In a list of acceptable answers where more than one mark is available 'any **two** from' is used, with the number of marks emboldened. Each of the following lines is a potential mark.

2.2 A bold **and** is used to indicate that both parts of the answer are required to award the mark.

2.3 Alternative answers acceptable for a mark are indicated by the use of **or**. (Different terms in the mark scheme are shown by a / ; eg allow smooth / free movement.)

3. Marking points

3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which candidates have provided extra responses. The general principle to be followed in such a situation is that 'right + wrong = wrong'.

Each error/contradiction negates each correct response. So, if the number of error/contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as * in example 1) are not penalised.

Example 1: What is the pH of an acidic solution? (1 mark)

Candidate	Response	Marks awarded
1	4,8	0
2	green, 5	0
3	red*, 5	1
4	red*, 8	0

Example 2: Name two planets in the solar system. (2 marks)

Candidate	Response	Marks awarded
1	Pluto, Mars, Moon	1
2	Pluto, Sun, Mars, Moon	0

3.2 Use of chemical symbols / formulae

If a candidate writes a chemical symbol / formula instead of a required chemical name, full credit can be given if the symbol / formula is correct and if, in the context of the question, such action is appropriate.

3.3 Marking procedure for calculations

Full marks can be given for a correct numerical answer, as shown in the column 'answers', without any working shown.

However if the answer is incorrect, mark(s) can be gained by correct substitution / working and this is shown in the 'extra information' column;

3.4 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

3.5 Errors carried forward

Any error in the answers to a structured question should be penalised once only.

Papers should be constructed in such a way that the number of times errors can be carried forward are kept to a minimum. Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation e.c.f. in the marking scheme.

3.6 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **unless** there is a possible confusion with another technical term.

3.7 Brackets

(…..) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

3.8 Unexpected Correct Answers not in the Mark Scheme

The Examiner should use professional judgement to award credit where a candidate has given an unexpected correct answer which is not covered by the mark scheme. The Examiner should consult with the Team Leader to confirm the judgement. The Team Leader should pass this answer on to the Principal Examiner with a view to informing all examiners.

4.7.5.3 Sustainable fisheries

BLY1F Question 1

	answers	extra information	mark
(a)(i)	any **two** from: • light • water • space • nutrients / ions / minerals / named • carbon dioxide / CO_2	list principle ignore oxygen / food / sun	2
(ii)	less competition for water **or** more water / nutrients / minerals available	ignore space / light / food	1
(b)	camouflage / same shape as leaf / looks like a leaf	allow ‘blends in’ ignore colour	1
total			4

4.7.5.3 Sustainable fisheries

BLY1F Question 2

	answers	extra information	mark
(a)	any **three** from: • water • ions / minerals / salts • temperature • blood sugar • heart rate • blood pressure	 allow breathing / oxygen / carbon dioxide allow sodium / chloride, other ions neutral allow heat ignore urea	3
(b)	contraceptive drug fertility drug		1 1
(c)(i)	eg nicotine, alcohol, cocaine, heroin, painkillers, tranquilisers, LSD	allow cannabis / weed or other alternative names allow tobacco ignore smoking / ecstasy	1
(ii)	alters body chemistry **or** craving / needing / dependence withdrawal symptoms on stopping	allow psychological dependence allow withdrawal described allow ‘feel ill without it’	1 1
total			8

4.7.5.3 Sustainable fisheries

BLY1F Question 3

	answers	extra information	mark
	joining sexual identical asexual clones		1 1 1 1 1
total			5

BLY1F Question 4

	answers	extra information	mark
(a)	7.8		1
(b)	14 / 13.6	allow answer 13 without working for **1** mark 7500 ÷ 550 gains **1** mark	2
(c)	produces / increases blood cholesterol affects heart **or** affects blood vessels **or** affects blood pressure	ignore obesity accept clogs blood vessels	1 1
(d)	(increases) blood pressure	ignore references to heart / blood vessels	1
total			6

4.7.5.3 Sustainable fisheries

BLY1F Question 5

	answers	extra information	mark
(a)	fossils / teeth / bones / skeleton / foot prints	allow cave drawings do **not** accept scientists have seen them	1
(b)	only (some) bones remain / soft parts have decayed	accept 'no-one has ever seen one' allow no photos, no pictures, no drawings	1
(c)	any **two** from: • hunted by human • (new) predator • (new) competitor • (new) disease • environment changed / named environmental change • prey extinct / loss of food supply	 allow more predators allow natural disaster ignore not enough food	2
total			4

4.7.5.3 Sustainable fisheries

BLY1F Question 6

	answers	extra information	mark
(a)(i)	56	accept 54 – 58	1
(ii)	increased		1
	reasonable qualification eg slowly then more quickly **or** to 174 / 176 **or** by 138 / 140		1
(b)	any **two** from:		2
	• no immunity **or** antibodies ineffective	accept no resistance	
	• no vaccines **or** humans not immunised		
	• idea of large scale contact **or** large scale travel	do **not** accept passed on ignore no cure	
total			5

4.7.5.3 Sustainable fisheries

BLY1F Question 7

	answers	extra information	mark
(a)	scientists figures based on research / calculations / data **or** scientists sample whole area	ignore reasons based on bias	1
	fishermen based on impression / hearsay / experience **or** fishermen fish in well-stocked / limited areas	scientists sample a wider area = **2** marks fishermen only fish in well-stocked areas = **2** marks if no marks gained fishermens' opinion **and** scientists' opinion gains **1** mark	1
(b)	any **two** from: • economic considerations • political impact • pressure groups **or** fears of extinction	 eg fear for jobs, profits, big demand for cod eg allow EU / government decide or laws will be passed	2
total			4

4.7.5.3 Sustainable fisheries

BLY1F Question 8

	answers	extra information	mark
(a)	any **two** from: • area of bed sampled • sampling time • size of net • kicking action • net position	control variables from information given	2
(b)	any **two** from: • some animals not dislodged • some animals missed / through / escaped net • invertebrates difficult to identify • invertebrates from outside area	must be ideas related to a sample ignore reliability etc	2
(c)	10 to 99 **or** 10 – 99 **or** 99 to 10 **or** 99 – 10		1
(d)	any **two** from: • increased / goes up • 0 at sample 4 • to (more than) 100	allow increase implied from all data described	2
(e)	mayfly because not found downstream of point where sewage enters stream **or** only in the unpolluted water		1 1
total			9

4.7.5.3 Sustainable fisheries

Answer 06 · Examiner comments

November 2020 | 8461/2F | Original Q9

Question 9 (standard demand)

The question was about human population increase and the problem of provision of sufficient food. For the calculation in **09.2**, both of the values required were given in the information, so it was not necessary to determine figures from the graph. Despite this, many students did attempt to, often incorrectly. For those who did show the correct numbers in their calculations, a large proportion used them incorrectly, often adding them and very few did the necessary calculation of dividing the difference by 50. Some just left the value at '0.9' and a significant number divided this by 5, rather than by 50. Others calculated the mean of the two given values rather than the mean annual increase.

In **09.3** most students attempted to draw some sort of extrapolation on the graph; however, this was often not linked to the trend shown by the line, rising a little, then plateauing or even taking a downturn. Students could still gain the second mark for reading the correct value from their own line. Often this was not done accurately, particularly by students who continued their extrapolation beyond 2050 and read off the final population value. It was clear that students who simply read the scale, and gave answers such as '10' had not considered the implication that their answer of a human population of only 10, rather than 10 billion, is unlikely.

Of the more successful students in **09.4** these showed some understanding of the term 'quota' and described limiting fishing in one way or another. However, this was as far as some got as they omitted the idea that the remaining fish would be able to reproduce, in order to maintain stocks. Lower-attaining students often suggested that a quota referred to the amount of fish that people could buy or eat. In **09.5** many students did not link the need for more farmland to an increasing population needing more food. References to the use of chemicals to enhance growth were only given very occasionally. In terms of reduced biodiversity, hardly any students went beyond 'cutting down trees' and habitat loss. Few students referred to methane production but these rarely went any further. Whilst many students filled up the available space, most of these simply repeated the same vague points in order to do so.

4.7.5.3 Sustainable fisheries

Concluding Remarks

Particular problems which occurred quite frequently included:

- confusion of certain terms, eg mitosis / meiosis, reabsorption / filtration / excretion
- paying insufficient attention to information provided in the stem of a question in order to guide a reasoned response, avoid misconceptions and the inclusion of irrelevant information
- repeating, rather than using, information given in the question, for which no marks are available
- careless reading of the question resulting in an inappropriate answer, or not following instructions in multiple-choice items, such as to tick the correct number of boxes
- careless reading of data from a graph
- omitting numbers when a question asks for the use of data
- missing a question when no answer lines were provided and the answer needed to be in a table or a Punnett square
- poor handwriting, for example with numerals – especially the distinction between the numbers 1 and 2
- not checking whether the answer to a calculation is sensible – for example, in converting units over an appropriate order of magnitude, such as the conversion of nanometres to metres.

4.7.5.3 Sustainable fisheries

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.