AQA GCSE Biology | 8461

SPECIFICATION POINT 4.7.3.2

Waste management

Mark schemes and examiner comments

Tier	**Higher**
Question groups	**43**
Available paper years	**2007–2022**

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.

4.7.3.2 Waste management

Answer 01 · Mark scheme

March 2007 | BLY1B | Original Q9 | Legacy

Nine	**2**	**3**	**3**	**2**

4.7.3.2 Waste management

Answer 01 · Mark scheme

March 2007 | BLY1B | Original Q9 | Legacy

BLY1B (Evolution and Environment) Higher Tier

Question	Key		
One	**A**	cell	**1**
	B	chromosome	**4**
	C	enzymes	**2**
	D	gene	**3**
Two	**A**	parents	**4**
	B	politicians	**1**
	C	scientists	**2**
	D	society	**3**

	A	B	C	D
Three	**4**	**4**	**2**	**1**
Four	**2**	**3**	**3**	**2**
Five	**1**	**4**	**2**	**4**
Six	**3**	**4**	**4**	**3**
Seven	**1**	**2**	**4**	**4**
Eight	**1**	**1**	**1**	**3**
Nine	**2**	**3**	**4**	**3**

4.7.3.2 Waste management

Answer 02 · Mark scheme June 2007 | BLY1B | Original Q2 | Legacy

Two	**A**	trees	**3**	
	B	cattle	**4**	
	C	lichens	**1**	
	D	invertebrates	**2**	

	A	**B**	**C**	**D**

Answer 03 · Mark scheme June 2007 | BLY1H | Original Q2 | Legacy

The full source mark scheme begins on page 50. Follow original question 2 in that document.

Answer 04 · Mark scheme November 2007 | BLY1A | Original Q9 | Legacy

Nine	**3**	**2**	**1**	**3**

Answer 05 · Mark scheme November 2007 | BLY1B | Original Q5 | Legacy

Five	**4**	**2**	**3**	**1**

4.7.3.2 Waste management

Answer 06 · Mark scheme March 2008 | BLY1BP | Original Q1 | Legacy

One	**A**	carbon dioxide	**3**
	B	pesticide	**4**
	C	fertiliser	**1**
	D	sewage	**2**

Answer 07 · Mark scheme March 2008 | BLY1BP | Original Q5 | Legacy

Five	**1**	**3**	**4**	**1**

Answer 08 · Mark scheme June 2008 | BLY1BP | Original Q8 | Legacy

Eight	**2**	**2**	**3**	**3**

Answer 09 · Mark scheme June 2008 | BLY1BP | Original Q9 | Legacy

Nine	**3**	**2**	**2**	**1**

Answer 10 · Mark scheme November 2008 | BLY1BP | Original Q4 | Legacy

Four	**4**	**2**	**1**	**2**

Answer 11 · Mark scheme November 2008 | BLY1BP | Original Q7 | Legacy

Seven	**4**	**2**	**2**	**1**

4.7.3.2 Waste management

Answer 12 · Mark scheme January 2009 | BLY3H | Original Q8 | Legacy

question	answers	extra information	mark
8	any **four** from: Points for Ethanol: • renewable fuel **or** carbon neutral **or** uses plant <u>waste</u> • less CO / hydrocarbons / SO_2 / NOx emissions • details of what emissions do eg CO is toxic / hydrocarbons cause smog / SO_2 / NO_x causes acid rain Points against Ethanol: • releases less energy • so need to burn more • more fuel loss due to evaporation • need to burn fuel to grow and process crop plants • reduces (land use for) food crops / causes deforestation Debatable points: • claimed to increase NO_x emissions – but this not <u>observed</u> by air quality monitoring • takes more energy to produce than it releases – but sugar cane yields 8:1 / maize yields 1.34:1 Conclusion: sensible conclusion for **or** against ethanol substantiated by information from passage	 max **3** marks allow petrol is non renewable less <u>named</u> emission max **3** marks **must** reach conclusion using information from the passage	4 1
Total			**5**

Answer 13 · Mark scheme March 2009 | BLY1BP | Original Q3 | Legacy

Three	**2**	**3**	**3**	**2**

4.7.3.2 Waste management

Answer 14 · Mark scheme June 2009 | BLY1BP | Original Q4 | Legacy

Four	**2**	**2**	**1**	**3**

Answer 15 · Mark scheme June 2009 | BLY1BP | Original Q9 | Legacy

Nine	**3**	**2**	**1**	*

* This question has been removed

4.7.3.2 Waste management

Answer 16 · Mark scheme June 2009 | BLY2H | Original Q2 | Legacy

Question 2

question	answers	extra information	mark
2(a)(i)	increase / higher / faster / quicker numerical comparison eg from 30 to 60 / by 30 **or** it is 30 at 15°C and 60 at 25°C	 award **2** marks for doubles / goes twice as fast or 30 units <u>more</u>	1 1
2(a)(ii)	any **two** from: • oxygen / air (in) • for microorganisms / bacteria / microbes / fungi / decomposers • (for aerobic) respiration • let heat out • heat kills microorganisms	 do **not** accept lets oxygen / air out ignore reference to other substances / light passing in or out ignore microorganisms passing in ignore worms / germs / bugs ignore heat in	2
2(b)	compost contains minerals / nutrients / elements / ions / named	allow improve moisture / drainage allow nitrogen ignore CO_2 / food / goodness / fertilisers do **not** accept vitamins / glucose etc	1
Total			**5**

4.7.3.2 Waste management

Answer 16 · Mark scheme

June 2009 | BLY2H | Original Q2 | Legacy

BLY2H

4.7.3.2 Waste management

Answer 17 · Mark scheme

Question 1

question	answers	extra information	mark
1(a)	A	no mark – can be specified in reason part if B given = no marks throughout if unspecified plus two good reasons = 1 mark	
	high(er) pressure in A	allow opposite for B do not accept 'zero pressure' for B	1
	pulse / described in A	accept fluctuates / 'changes' allow reference to beats / beating ignore reference to artery pumping	1
1(b)(i)	17		1
1(b)(ii)	68	accept correct answer from candidate's (b)(i) x 4	1
1(c)(i)	oxygen / oxygenated blood	allow adrenaline ignore air	1
	glucose / sugar	extra wrong answer cancels eg sucrose / starch / glycogen / glucagon / water allow fructose as an alternative to glucose ignore energy ignore food	1

Question 1 continues on the next page…

4.7.3.2 Waste management

Answer 17 · Mark scheme

BLY3H

Question 1 Continued

question	answers	extra information	mark
1(c)(ii)	carbon dioxide / CO_2 / lactic acid	allow CO2 / CO^2 ignore water	1
Total			**7**

4.7.3.2 Waste management

Answer 17 · Mark scheme

June 2009 | BLY3H | Original Q1 | Legacy

BLY3H

4.7.3.2 Waste management

Answer 18 · Mark scheme

June 2009 | BLY3H | Original Q3 | Legacy

Question 3

question	answers	extra information	mark
3(a)	methane	accept CH_4 / CH4 / CH^4 extras cancel	1
3(b)	**anaerobic** respiration **or** fermentation	ignore decay / decomposition / digestion do **not** allow aerobic	1
3(c)(i)	in range 32 – 33		1
3(c)(ii)	keep cool(er) **or** keep below 40 (°C) **or** insulate from heat high(er) / optimum rate of biogas production **or** rate decreases at higher temperatures **or** works more efficiently	allow keep at optimum temperature if (c)(i) < 40 allow correct reference to rate of enzyme action eg high temperature would denature enzyme owtte	1 1
3(d)	increases rate / high rate insulates / keeps warm	allow 'works better' allow maintains optimum temperature	1 1
Total			**7**

4.7.3.2 Waste management

Answer 18 · Mark scheme

June 2009 | BLY3H | Original Q3 | Legacy

BLY3H

4.7.3.2 Waste management

Answer 19 · Mark scheme

January 2010 | BLY1H | Original Q3 | Legacy

Question 3

question	answers	extra information	mark
3(a)	any **one** from eg: • shorter distance between samples • sample to greater height • specify the size of each site	ignore repeat investigation / measurements ignore longer transect	1
3(b)(i)	Parmelia		1
3(b)(ii)	Evernia		1
3(c)	any **two** from: • Lecanora does not extend over whole range of transect / does not grow everywhere /does not grow in town centre / does not grow in countryside • Lecanora grows in a range of sulfur dioxide concentrations ***or*** Lecanora only grows in limited range of sulfur dioxide concentrations **or** Lecanora lives over large range of sulfur dioxide concentrations • other factors eg different pollutant might also influence growth of Lecanora • sulfur dioxide / pollutant concentration was not measured • amount of Lecanora not measured	ignore Lecanora does not give accurate measure of sulfur dioxide concentration	2
Total			**5**

4.7.3.2 Waste management

Answer 19 · Mark scheme

January 2010 | BLY1H | Original Q3 | Legacy

BLY1H

4.7.3.2 Waste management

Answer 20 · Mark scheme

Question 4

question	answers	extra information	mark
4(a)	methane / CH_4	allow CH^4 / CH4 / H4C	1
4(b)(i)	any **two** from: • less visual impact • less heat loss **or** (better) insulated **or** temperature will be less variable / keeps warm / keeps cool **or** easier to maintain optimum temperature • withstand pressure build-up • ease of adding material / slurry	ignore reference to smell	2
4(b)(ii)	any **one** from: • to keep anaerobic • to prevent oxygen / air entering • to prevent biogas escaping • to maintain pressure / to allow removal of biogas		1
4(c)	any **two** from: • to maintain optimum temperature • to speed up production of biogas **or** reference to faster microbial action / named microbial process • UK temperature is low/below 25 ºC • self sufficient / sustainable	ignore to keep warm if reference to specific temperature accept any value in range 26 – 40 ºC as optimum UK temperature is below optimum = **2** marks	2
Total			**6**

4.7.3.2 Waste management

Answer 20 · Mark scheme

January 2010 | BLY3H | Original Q4 | Legacy

BLY3H

Answer 21 · Mark scheme

March 2010 | BLY1BP | Original Q7 | Legacy

Seven	**2**	**3**	**4**	**3**

Answer 22 · Mark scheme

June 2010 | BLY1BP | Original Q1 | Legacy

No matching mark scheme was available in the supplied archive for this question.

4.7.3.2 Waste management

Answer 23 · Mark scheme

June 2019 | BLY2H | Original Q2 | Legacy

Question 2

question	answers	extra information	mark
2(a)(i)	20		1
2(a)(ii)	one tenth / 0.1 / 10% / 1:9 / 1 in 10 / 1 out of 10 / $\frac{1}{10}$	for correct answer irrespective of working ignore any units accept equivalent fractions eg $\frac{4}{40}$ / $\frac{2}{20}$ do **not** allow eg 1:10 / 1 to 10 if answer is incorrect clear selection of 2 **and** 20, **or** equivalent **or** 1:4:5 / 1:5:4 gains **1** mark	2
2(b)	any **two f**rom: • (body) heat / maintaining body temperature • movement (max 2) • growth / cell division / repair / reproduction / building molecules • accept active transport	do **not** accept sweating / cooling / excretion allow keep warm allow **2 different** examples of movement, internally and / or externally eg breathing / exercise / eating / circulation allow muscle contraction if no other muscle action is credited movement + breathing = 1 mark allow examples eg making proteins (from amino acids) ignore 'chemical reactions' / digestion	2

Question 2 continues on the next page

4.7.3.2 Waste management

BLY 2H

Question 2 continued

question	answers	extra information	mark
2(c)	more movement / have to hunt / catch food	allow converse if stated for herbivore eg herbivores food is all around ignore reference to size **or** predator unqualified	1
2(d)	any **two** from • less movement • less heat loss • less respiration	ignore reference to food allow no movement allow less space to move ignore less space unqualified allow no heat loss **or** they are kept warm	2
Total			**8**

4.7.3.2 Waste management

Answer 23 · Mark scheme June 2010 | BLY2H | Original Q2 | Legacy

BLY 2H

Answer 24 · Mark scheme November 2010 | BLY1BP | Original Q4 | Legacy

Four	**1**	**3**	**3**	**1**

Answer 25 · Mark scheme November 2010 | BLY1BP | Original Q5 | Legacy

Five	**2**	**3**	**4**	**1**

4.7.3.2 Waste management

Answer 26 · Mark scheme

January 2011 | BLY1H | Original Q8 | Legacy

Question 8

question	answers	extra information	mark
8(a)	two species / types involved		1
8(b)	any **three** from: pros (max **two** pros) • useful if species difficult to breed • prevents extinction / continues genetic line cons (max **two** cons) • low success rate **or** figures given • development problems • diverts attention from habitat conservation / poaching / pollution / climate change • cloning reduces gene pool conclusion argued conclusion	full marks only if at least **one** pro, **one** con and an attempt at a conclusion ignore reference to ethical issues / cruelty must include references to **both** pros and cons and must be at end of answer	3 1
Total			**5**

4.7.3.2 Waste management

Answer 27 · Mark scheme March 2011 | BLY1BP | Original Q5 | Legacy

Five	**4**	**3**	**3**	**3**

Answer 28 · Mark scheme March 2011 | BLY1BP | Original Q8 | Legacy

Eight	**4**	**2**	**1**	**2**

Answer 29 · Mark scheme June 2011 | BLY1BP | Original Q5 | Legacy

Five	**3**	**4**	**4**	**3**

Answer 30 · Mark scheme June 2011 | BLY1BP | Original Q6 | Legacy

Six	**3**	**4**	**4**	**4**

4.7.3.2 Waste management

Answer 31 · Mark scheme

June 2012 | BL1HP | Original Q6 | Legacy

Question 6

question	answers	extra information	mark
6 (a)	(jellyfish) gene(s) cut out		1
	ref to enzymes (at any stage)		1
	(gene) transferred to zebra fish at early stage of development / embryo / egg	ignore removal of zebra fish genes	1
6 (b)	any **two** from: • could transfer gene to other (fish) species • effects on food chains • effects on zebra fish themselves, eg may out compete non GM zebra fish	ignore unethical / religious / unnatural accept effects on other species / humans who eat them	2
Total			**5**

4.7.3.2 Waste management

Answer 31 · Mark scheme June 2012 | BL1HP | Original Q6 | Legacy

BL1HP

Answer 32 · Mark scheme June 2014 | BL3HP | Original Q7 | Legacy

7(a)(i)	(initially there is) oxygen (so) aerobic respiration (by microorganisms) producing CO_2 (which does not burn)	accept: oxygen hasn't been used up yet (so not anaerobic conditions yet) (because) methane is produced in anaerobic (fermentation) there is no methane ignore inflammable	1 1 1	AO1 / AO2 3.4.3c
7(a)(ii)	(peelings had) the most carbohydrate / organic material	answer must be comparative accept contained more microorganisms / decomposers / bacteria ignore water do **not** allow fat or protein	1	AO3 3.4.3c
7(b)(i)	0.22 / 0.221	correct answer with or without working gains 2 marks allow 0.2 for 1 mark allow 22.1 for 1 mark allow 0.34 × 65 / 0.65 for 1 mark	2	AO2 3.4.3c
7(b)(ii)	(sheep manure) produces a higher volume of biogas / almost double **or** produces 0.27 (m^3 per kg) more (sheep manure) produces biogas with a higher percentage methane **or** produces 2% more methane	accept 0.408(7) / 0.41 / 0.409 (m^3) from sheep for 2 marks accept 0.1877 / 0.188 / 0.19 (m^3) more than cow's manure for 2 marks allow correct difference in volume calculated using 0.408(7) / 0.41 / 0.409 minus answer given in 7(b)(i) for 2 marks	1 1	AO2 3.4.3c
Total			8	

4.7.3.2 Waste management

Answer 33 · Mark scheme

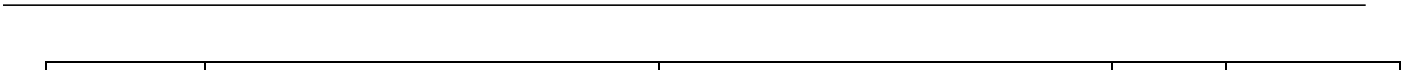
June 2015 | BL3HP | Original Q1 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
1(a)(i)	fungus		1	AO1 344d
1(a)(ii)	oxygen / O_2	accept air accept O_2 do **not** allow O^2/ O / O2	1	AO2 344d
1(a)(iii)	glucose (syrup)	allow carbohydrate / sugar ignore food / starch allow oxygen if oxygen / air not given in (a)(ii)	1	AO1 344d
1(b)	any **two** from: • quicker • suitable for vegetarians • cheaper • more efficient **or** less land / methane	ignore high in protein ignore sustainability unqualified ignore less pollution unqualified allow less animals harmed / killed allow food chain is shorter **or** has less trophic levels allow less energy lost (from the food chain) do **not** allow no energy lost allow low(er) in calories (than some meat) allow low(er) in fat / healthier (than some meat) allow source of fibre / prevent constipation	2	AO3 344a/d
Total			**5**	

4.7.3.2 Waste management

Answer 33 · Mark scheme

June 2015 | BL3HP | Original Q1 | Legacy



4.7.3.2 Waste management

Answer 34 · Mark scheme June 2015 | BL3HP | Original Q4 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
4(a)	(rapid) growth in population (size) increase in the standard of living	 accept description of increased standard of living, eg more packaging, more food thrown away or overbuying resources	1 1	AO1 341a
4(b)(i)	41.5	allow 1 mark for 9733 ÷ 23454 **or** allow 1 mark for 0.415 **or** allow 1 mark for 41.49 **or** 41 **or** 41.4	2	AO2 341
4(b)(ii)	any **four** from: arguments for: • there has been a reduction in total waste • there has been an increase in (total mass of) recycling • there has been an increase in the percentage of waste recycled • it (may) not be possible to achieve zero waste arguments against: • there is still a lot of waste (not recycled) • there has only been a small reduction in total waste • there was one year (2006) where total waste went up • the rate of increase of percentage recycled is slowing down • no information on materials reused • no information on waste from factories / industry	max 3 marks for a one sided argument allow as reason against if clear allow still more than half or 56.8% of waste (not recycled)	4	AO3 341

4.7.3.2 Waste management

Answer 34 · Mark scheme

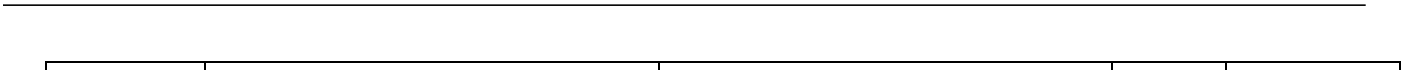
June 2015 | BL3HP | Original Q4 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
4(c)(i)	any **two** from: • reduce biodiversity **or** extinction • change in migration patterns • change in species distribution • change in climate	ignore rise in sea levels ignore temperature change accept correct examples of climate change eg storms, flooding, drought references to weather changing is insufficient allow ice caps melting or habitat destruction	2	AO1 343a
4(c)(ii)	any **one** from: • absorbed by oceans / ponds / lakes • peat bogs	allow used for skeletons / shells of sea creatures allow in fossil fuels / limestone	1	AO1 343b
Total			**11**	

4.7.3.2 Waste management

Answer 34 · Mark scheme

June 2015 | BL3HP | Original Q4 | Legacy



4.7.3.2 Waste management

Answer 35 · Mark scheme

June 2015 | BL3HP | Original Q7 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7(a)	(the kidney) filters the blood	ignore refs to hormones and drugs	1	AO1 331a/c
	(and then) reabsorbs <u>all</u> of the glucose		1	
	reabsorbs some of the ions	allow salts ignore minerals	1	
	reabsorbs some of the water		1	
	releases urea (in urine)		1	
7(b)(i)	should fall from 28 (to the end of dialysis)	ignore any line drawn after end of dialysis allow + / - 0.5 square graph line must fall to / below below 15	1	AO2 331d/e
7(b)(ii)	should stay level at about 6 throughout	ignore slight variations allow + / - 1 square ignore any line drawn after end of dialysis	1	AO2 331d/f
7(c)(i)	immune system	allow white blood cells / lymphocytes	1	AO1 331g/h
	(produces) antibodies		1	
	(which) attack the antigens (on the transplanted kidney)	non-matching antigens insufficient	1	
7(c)(ii)	any **one** from: • tissue typing (to find match) • treating with drugs that suppress the immune system	accept treat with immunosuppressants	1	AO1 331i
Total			**11**	

4.7.3.2 Waste management

Answer 36 · Mark scheme June 2016 | BL1HP | Original Q7 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7(a)(i)	any **two** from: • not all eaten • used for respiration • lost as CO_2 / water / urea • lost as faeces **or** not all digested	 allow eaten by other animals ignore used / lost in heat / movement if neither mark awarded allow 1 mark for lost as waste ignore references to energy losses do **not** allow for growth / repair / reproduction	2	AO1 1.5.1b/c
7(a)(ii)	any **one** from: • thrushes eat other things • thrush numbers likely to vary (considerably) • thrushes were not present all the time • thrushes feed on a much bigger area	 allow it is only an estimate (of population size) **or** only counted thrushes for 5 hours	1	AO3 1.5.1
7(b)(i)	any **one** from: • there are two dependent variables • there is no independent variable • to show the association / correlation / pattern (between the two variables)		1	AO2 1.5.1

4.7.3.2 Waste management

Answer 36 · Mark scheme

June 2016 | BL1HP | Original Q7 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
7(b)(ii)	(snails in woodlands) more have dark(er) colour (ed shells) **or** fewer have light-coloured shells (shells have) no / fewer stripes or have no stripes	allow converse for grassland, if clear allow converse for grassland, if clear	1 1	AO2 1.4.1d/f/g
7(b)(iii)	less likely to be seen (by predators / birds / thrushes)	allow camouflaged (from predators / birds / thrushes) allow light coloured shells with stripes would be more visible (to predators / birds / thrushes in woodland (than grassland)).	1	AO3 1.4.1d/f/g
7(c)(i)	*Indicator species* invertebrate (animals) **or** correctly named invertebrate *Environmental factor* (concentration of dissolved) oxygen	both required for **1** mark allow water pollution allow other correct examples	1	AO1 1.4.2c
7(c)(ii)	oxygen meter	must match factor given in **(c)(i)** allow oxygen probe / sensor (and data logger) ignore pollution meter	1	AO1 1.4.2d
Total			**9**	

4.7.3.2 Waste management

Answer 37 · Mark scheme

June 2016 | BL3HP | Original Q9 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
9(a)(i)	fewer cows any **one** from: • less methane • less CO_2 in the atmosphere because of less deforestation **or** less plants consumed.	 do **not** allow CH^4 allow less CO_2 released into the atmosphere because less fuel used e.g. to heat cowsheds **or** to transport meat do **not** allow CO^2	1 1	AO2/3 3.4.2c 3.4.3a
9(a)(ii)	any **two** from: • could be mass produced to feed an increasing population • disease free meat • no / low fat • no harm to animals or less intensive farming • antibiotic free meat • more land available for farming crops	 allow (may be) suitable for vegetarians allow no energy loss along a food chain	2	AO3 3.4.4a/b
9(b)	 fungus / *Fusarium* with glucose (syrup) in aerobic conditions **or** in presence of oxygen mycoprotein is harvested / purified	ignore stirring / mixing and temperature ignore air allow ammonia added (as source of nitrogen)	 1 1 1 1	AO1 3.4.4d
Total			**8**	

4.7.3.2 Waste management

Answer 38 · Mark scheme

June 2017 | BL3HP | Original Q3 | Legacy

Question	Answers	Extra information	Mark	AO / Spec.
3			6	AO1 3.3.1a/c 3.1.2b

Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a 'best-fit' approach to the marking.

0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)
No relevant content	The name (N) of a waste product is given **or** a process (P) that makes a waste product **or** an organ (O) involved	The name of a waste product is given which is linked to **either** the process that it is made in **or** the organ involved	The names of waste products are given of which at least one is correctly linked to the process it is made in **and** the organ(s) involved

examples of the points made in the response

- (N) urea
- (P) from the breakdown of amino acids
- (O) (amino acids broken down) in the liver
- (O) removed by kidneys
- (O) bladder removes urine (from the body)

- (N) CO_2
- (P) from respiration
- (O) in a named organ **or** in cells
- (O) breathed out from lungs

- (N) water
- (P) from respiration
- (O) in a named organ **or** in cells
- (O) breathed out from lungs
- (O) through skin (by sweating)
- (O) by kidneys
- (O) bladder removes urine (from the body)

extra information
ignore faeces

'Give credit for any extra correct knowledge – eg toxins are broken down in the liver and the products removed in kidneys/urine.'

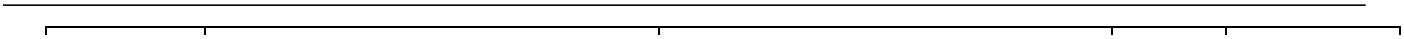
- (N) ions
- (P) from eating and drinking
- (O) skin (through sweating)
- (O) by kidneys
- (O) bladder removes urine (from the body)

Total		6

4.7.3.2 Waste management

Answer 38 · Mark scheme

June 2017 | BL3HP | Original Q3 | Legacy



4.7.3.2 Waste management

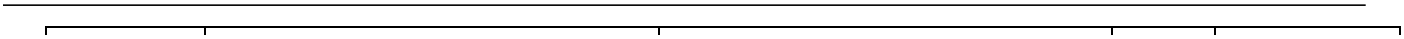
Answer 39 · Mark scheme June 2017 | BL3HP | Original Q4 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
4(a)	Causes acid rain		1	AO1 3.4.1b
4(b)(i)	66(%) or 65.7(%)	allow 1 mark for 920 **or** ecf from first line	2	AO2 3.4.1b
4(b)(ii)	it rises **and** then falls maximum level in 2005 **or** maximum reached at 400 (thousand tonnes)		1 1	AO2 3.4.1b
Total			**5**	

4.7.3.2 Waste management

Answer 39 · Mark scheme

June 2017 | BL3HP | Original Q4 | Legacy



4.7.3.2 Waste management

Answer 40 · Mark scheme

June 2018 | 8461/2H | Original Q7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	*x*-axis: scale + labelled, including units	scale ≥ ½ width of graph paper label: biomass in g/m^2	1	AO2 4.7.4.1 4.7.4.2
	bar widths correct	± ½-square each side allow 1 mark if 3 correct	2	
	all 4 bars correctly labelled	large fish + small fish + invertebrate (animals) + algae **or** (trophic level) 4 + 3 + 2 + 1 **or** tertiary consumer + secondary consumer + primary consumer + producer ignore bar heights	1	
07.2		an answer of 99 scores **3** marks		AO2 4.7.4.3
	$\frac{840 - 10}{840} \times 100$	allow equivalent calculation	1	
	98.809523... / 98.810 / 98.81 / 98.8		1	
	99	allow answer given to two significant figures from an incorrect calculation in step 2	1	
07.3	inedible parts / example **or** egested / faeces **or** respiration / as CO_2	allow eaten by other animals **or** not all organisms eaten allow not digested allow excretion / urine ignore waste ignore energy losses ignore movement	1	AO1 4.7.4.3

4.7.3.2 Waste management

Answer 40 · Mark scheme

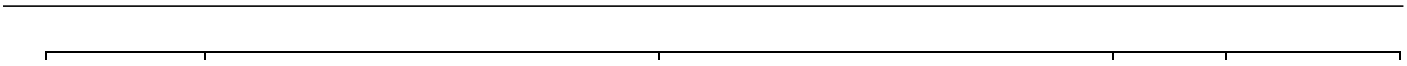
June 2018 | 8461/2H | Original Q7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.4		ignore causes of death for algae and plants		
	bacteria decay organic matter / sewage / algae / dead plants		1	AO1 4.7.2.3
	(by) digestion	allow example such as starch broken down to sugar **or** protein broken down to amino acids	1	AO1 4.2.2.1 4.7.4.1
	(and) bacteria respire aerobically **or** respire using oxygen		1	AO1 4.4.2.1
	(which) lowers oxygen concentration (in water) **or** fish have less oxygen	allow reduced respiration of fish	1	AO2 4.4.2.1
	(so) reduced energy supply causes death of fish	allow toxins in the sewage kill fish ignore pathogens or (pathogenic) bacteria cause disease in fish and kills them	1	AO2 4.4.2.1
Total			**13**	

4.7.3.2 Waste management

Answer 40 · Mark scheme

June 2018 | 8461/2H | Original Q7



4.7.3.2 Waste management

Answer 41 · Mark scheme

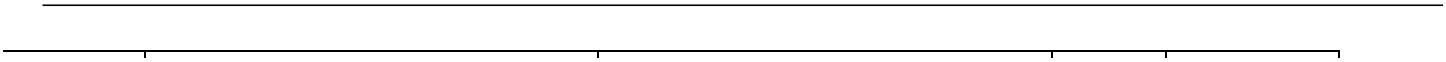
November 2020 | 8461/2H | Original Q7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	triangular pyramid with 3 levels		1	AO1 4.7.4.1 4.7.4.2
	correct labels: (waste) vegetables / plants; insect(s); dog(s)	do **not** accept additional incorrect labels	1	AO2 4.7.4.2
07.2	any **two** from: • carbon dioxide from respiration (from dog) • urea from excretion (from dog) • not all parts (of insects) are absorbed / digested (by dog)	allow carbon dioxide breathed out (by dog) allow urea in urine (from dog) allow faeces from egestion (from dog) ignore references to loss of energy if no other mark awarded allow **two** factors without descriptions for **1** mark	2	AO1 4.7.4.3
07.3	less land required		1	AO2 4.7.5.1 4.7.3.5
	(so) more space for crops (for humans)	allow more meat (from cows etc) for humans	1	
	less methane (from animals) therefore less global warming	allow less methane from rotting vegetables in landfill	1	
	(therefore) less harmful effects of global warming on (human) food production	allow example such as less flooding of farmland allow may lead to the development of more foods for humans made from insects	1	
Total			**8**	

4.7.3.2 Waste management

Answer 41 · Mark scheme

November 2020 | 8461/2H | Original Q7



4.7.3.2 Waste management

Answer 42 · Mark scheme

June 2022 | 8461/2H | Original Q4

Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	carbon dioxide **or** acidic gas(es)	allow other named example of acidic gas such as sulfur dioxide allow chemical formula e.g. SO_2 allow carbon monoxide allow particulates / smoke / soot allow methane / CFCs	1	AO1 4.7.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.2	any **three** from: • fertiliser • sewage • toxic chemicals • herbicide • fungicide	 allow nitrate / phosphate allow organic matter / faeces / urine / urea allow a named toxic chemical such as mercury **or** sulfur dioxide **or** acid rain allow insecticide allow oil allow nuclear waste allow other examples of water pollutants if herbicide / fungicide / insecticide not given allow (named) pesticide for **1** mark	3	AO1 4.7.3.2

4.7.3.2 Waste management

Answer 42 · Mark scheme

June 2022 | 8461/2H | Original Q4

Question	Answers	Mark	AO / Spec. Ref.
04.3	**Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	4–6	AO1 4.4.1.1 4.2.2.6 4.4.2.1 4.7.3.2 4.7.3.5
	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 **air pollution:** (carbon dioxide **or** methane **or** greenhouse gases) • global warming / climate change / traps heat ○ floods / fire / drought **or** ice caps melt **or** rise in sea level **or** extreme weather ○ loss of habitat / food ○ migration (acidic gas / named – eg SO_2 / NO_x) • damage to leaves so less photosynthesis • damage to roots or alters ions in soil (/ e.g. phosphates / iron) ○ (so) less protein manufacture • damage to lungs ○ breathing difficulties / bronchitis / asthma (carbon monoxide) • combines with haemoglobin ○ less oxygen carried (by haemoglobin / blood) (particulates / 'soot') • cover leaves **or** block light ○ less photosynthesis so less glucose made • damage to lungs ○ breathing difficulties / bronchitis / asthma **water pollution**: (sewage) • bacteria multiply ○ use oxygen in respiration ○ water animals cannot respire ○ pathogens in water (fertiliser) • algae multiply ○ (algae) block light so plants cannot photosynthesise ○ lack of oxygen for respiration – fish die		

	(toxic substances) • damages / harms cells **or** bioaccumulation ○ interferes with metabolism – e.g. respiration / protein synthesis (plastics) • entrap animals or causing internal damage if swallowed (particles) • block light ○ plants / algae cannot photosynthesise so less glucose made (oil) • damages birds' feathers ○ cannot fly so cannot find food **or** escape predators (acid rain / acids) • lowers pH of water ○ damages fish gills ○ bleaches coral		

Total Question 4		**10**

4.7.3.2 Waste management

Answer 43 · Mark scheme

June 2022 | 8461/2H | Original Q7

Question 7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	any **one** from: a change in • DNA • base code **or** nucleotide sequence • a base (in DNA) • a gene / allele • part of a chromosome • number of chromosomes • genetic code / material	ignore genetic information	1	AO1 4.6 4.6.1.5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.2	16 / sixteen		1	AO3 4.7.2.1 RPA9

4.7.3.2 Waste management

Answer 43 · Mark scheme

June 2022 | 8461/2H | Original Q7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.3	*volume of sample in mm³* 0.004		1	AO2 4.7.2.1 RPA9
	number of cells in 1 mm³ ***diluted*** *pond water* 14 ÷ 0.004	allow 14 ÷ (0.2 × 0.2 × 0.1) allow use of an incorrectly calculated volume of 0.04	1	
	3 500	allow ecf from answer to q.07.2 for number of algal cells	1	
	correct dilution factor ¼	allow dilution = ×4 **or** 4 times	1	
	number of cells in 1 mm³ ***undiluted*** *pond water* 3 500 × 4	allow a calculation based on a dilution factor of 5	1	
	14 000 **or** 1.4×10^4		1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.4	to make it easier to count	ignore easier to see **or** more spread out ignore quicker to count	1	AO3 4.7.2.1 RPA9

4.7.3.2 Waste management

Answer 43 · Mark scheme

June 2022 | 8461/2H | Original Q7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.5	smaller volume	allow (some) liquid / cells would leak out (from under the cover slip)	1	AO3 4.7.2.1 RPA9
	so fewer cells **or** lower cell count	allow this mark **only** if there is an attempt at an explanation	1	

Total Question 7		**11**

Version 1.0: 0707

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Science B 4462 / Biology 4411

BLY1H Unit Biology 1

Mark Scheme

2007 examination - June series

4.7.3.2 Waste management

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.

4.7.3.2 Waste management

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.

4.7.3.2 Waste management

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.

4.7.3.2 Waste management

BLY1H Question 1

	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

4.7.3.2 Waste management

BLY1H Question 2

	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

4.7.3.2 Waste management

BLY1H Question 3

	answers	extra information	mark
	adaptation and linked advantage eg	max **2** for 3 adaptations	max 2 max 2
	• roots widespread / long (1) to collect water from large area (1)	ignore large roots accept to collect more water	
	• some roots deep / long (1) to collect water from deep down (1)	ignore large roots accept to collect more water	
	• absence of leaves (1) reduces water loss (1)		
	• swollen stem (1) to store water (1)		
	• roots near surface (1) to absorb rainwater (1)		
	• roots widespread (1) support in sandy soil (1)		
total			4

4.7.3.2 Waste management

BLY1H Question 4

	answers	extra information	mark
(a)(i)	viruses live inside cells		1
	viruses inaccessible to antibiotic	allow drug / antibiotic (if used) would (have to) kill cell	1
(ii)	mutation	ignore mutation caused by antibiotic	1
	natural selection **or** no longer recognised by antibiotics	accept description of natural selection	1
(b)	(stimulate) antibody production	ignore antitoxin	1
	(by) white cells		1
	<u>rapidly</u> produce antibody on re-infection	ignore antibodies remain in blood	1
total			7

4.7.3.2 Waste management

BLY1H Question 5

	answers	extra information	mark
(a)	ovary or ovaries		1
(b)	(hormone) implant		1
(c)	do not have to remember to take		1
(d)	does not involve hormone **or** it is a mechanical method	allow coil may be dislodged allow egg <u>is</u> fertilised / released allow not preventing egg fertilisation / release	1
(e)	involves death of fertilised egg **or** (regard) fertilised egg as human **or** stops fertilised egg developing	allow embryo / baby for fertilised egg ignore against religion only allow fertilised egg is alive ignore side effects	1
(f)(i)	inhibit FSH (production) so no eggs mature / develop / are produced	allow inhibits LH allow (LH) <u>stimulates</u> egg release ignore progesterone	1 1
(ii)	contains FSH which causes egg to mature / develop / be produced **or** in women whose FSH is low	allow contain LH allow (LH) <u>stimulates</u> egg release	1 1
total			9

4.7.3.2 Waste management

BLY1H Question 6

	answers	extra information	mark
(a)	asexual reproduction / mitosis **or** no fusion of gametes **or** division after fusion **or** from fertilised egg **or** from same embryo **or** from same egg **and** sperm	ignore cloning	1
	each embryo has identical genetic information / genes / DNA / chromosomes		1
(b)	any **two** from: • experimental subject and control are identical **or** fair test since monkeys identical • monkeys similar to humans, so effect of drugs likely to be similar • all identical so will have same reaction to drugs / disease • it's better than catching wild ones	allow closely related so… ignore evolved from	2
total			4

4.7.3.2 Waste management

BLY1H Question 7

	answers	extra information	mark
(a)	any **two** from: • balance between two important for good heart health • high LDL causes heart disease / high cholesterol • high HDL reduces heart disease / cholesterol	ignore blood pressure do **not** accept converse argument do **not** accept converse argument	2
(b)	heart attacks greater amongst patients with low HDL levels statins reduce heart attacks of patients **or** placebo is less effective	ignore statins cause heart disease ignore comparative effects of the two statins allow pravastatin is more effective supported by appropriate calculations eg pravastatin > 39 33% < 39 31.4% Average 32.4 > 39 32% < 39 28.2% Average 30.05%	1 1
total			4

4.7.3.2 Waste management

BLY1H Question 8

	answers	extra information	mark
(a)	present day organisms have evolved from simpler organisms	ignore answers in terms of natural selection	1
	over long periods of time **or** millions / billions of years		1
(b)	(natural selection operates on successful) characteristics produced by chance / (random) mutation		1
	in this experiment caused by hormones / environment	allow this example indicates inheritance of acquired characteristics for **2** marks allow this is Lamarckism only for **1** mark	1
total			4

4.7.3.2 Waste management

Answer 41 · Examiner comments — November 2020 | 8461/2H | Original Q7

Question 7 (standard, standard/high & high demand)

This question presented students with a novel situation: the development of a new type of food for dogs from insects. This was set in the context of a food chain, the transfer of biomass and, ultimately, in the provision of food security for humans. **07.1** was a relatively straightforward question for students. Problems mainly arose in the labelling with the use of terms such as 'secondary' and 'tertiary' consumers (the latter being entirely inappropriate), or by adding multiple labels that included the names of the organisms, the types of producer and consumer and the numbered trophic levels, but with an error in one of these, and thus this mark could not be awarded. In 07.2 reasons given by students for the incomplete transfer of biomass from the insects to the dogs were largely incorrect, with 1% of students being able to describe two. Some students made inappropriate references to some of these processes occurring in the insects rather than in the dogs.

07.3 related the scenario of insect-based dog food to human food security. Students found this difficult and, although nearly three-quarters scored one mark (usually for stating that more meat would be available for human consumption if dogs were fed on insects), 7% gained further credit. Few realised that if less meat were consumed by dogs, then less land would be required for animal grazing and hence it could be utilised for growing crops. Hardly any suggested that a reduction in farm animals would perhaps reduce methane output and the negative effects of methane on the climate and hence on the growth of crops.

Answer 42 · Examiner comments — June 2022 | 8461/2H | Original Q4

Question 4

This question was about air and water pollution.

04.1 Almost 90 percent of students were able to name a substance that would cause air pollution, carbon dioxide and methane being the most common correct answers, but sulfur dioxide, carbon monoxide and particulates / smoke were also acceptable.

04.2 This was more demanding than the previous section as *three* substances that could cause water pollution had to be named. The most common correct answers included fertilisers, sewage and toxic chemicals (or a named example), followed by various types of pesticide and even nuclear waste. Some answers were rather vague – e.g. 'industrial waste' might well constitute mainly water and, as such, was not rewarded. Only a fifth of students were able to give three suitable examples with just over a half able to name at least one.

04.3 This was a 6-mark extended response question on how air and water pollution could be harmful to living organisms. To enter Level 2 (4 to 6 marks), students had to link specific effects to several phenomena related to named pollutants of both air and water. These could include, for example, melting of ice caps and loss of habitat linked to global warming caused by increasing concentrations of carbon dioxide in the air, and organisms in water being unable to respire due to bacteria multiplying and using up the oxygen in their own respiration, when raw sewage entered the water. Such linkages of cause and effect were, unfortunately, rarely given and only one in forty students attained Level 2.

Major problems included a lack of specific biological detail coupled with insufficient breadth of coverage for a variety of named pollutants. Many answers referred to 'pollutants' or 'harmful substances' which might be 'dangerous' or could 'harm / kill / cause illness'. A prevalent, incorrect belief was that rising carbon dioxide concentrations in the air would reduce the availability of oxygen and make it harder for us to breathe.

4.7.3.2 Waste management

Answer 43 · Examiner comments

June 2022 | 8461/2H | Original Q7

Question 7

This question was about the calculation of the population density of a microscopic unicellular alga and problems that might be encountered in the method of doing so.

07.1 Since the unusual colour of the alga had been caused by a mutation, students had to define the term *mutation*. Just under two-thirds understood that a mutation was a change in the genetic material, such as DNA, a base, a gene or a chromosome.

07.2 A description was given in the question of how a scientist set up a special slide with a counting grid in order to count the algal cells in a given volume of a suitably diluted sample of pond water. Section and plan diagrams of the special slide were given in **Figures 8** and **9**. Students then had to score the number of cells in a 0.2 mm × 0.2 mm square in **Figure 9**, observing the given rules for inclusion or exclusion of cells on the boundaries. Around three-quarters of students arrived at the correct answer of 16.

07.3 This question was a 6-mark calculation to find the number of algal cells in 1 mm^3 of undiluted pond water from a count of 14 cells in the 0.2 mm × 0.2 mm square. Many students presented their working in a manner that was very difficult to follow, with a series of mathematical operations that were clearly not equalities yet that were all interconnected with 'equals' signs. A large proportion of students regarded the volume of the sample on the special slide as being equal to 0.2 × 0.2 = 0.04, forgetting to multiply by the depth of 0.1 mm to obtain an actual volume of 0.004 mm^3. Some misinterpreted the scientist's dilution factor: 2.5 cm^3 made up to 10 cm^3 is a 4-fold dilution, not 5-fold as many thought. Many did not consider the dilution and ended up with an answer of 3500 (or 350 with the incorrect volume) instead of the correct value of 14 000.

The correct calculation was simply:

$$\frac{14 \times 4}{0.004} = 14\,000$$

but only around 1 in 8 students arrived at this answer.

4.7.3.2 Waste management

Answer 43 · Examiner comments

June 2022 | 8461/2H | Original Q7

07.4 To understand this question required thinking about the experimental situation and the results shown in **Figure 9**. If the pond water had not been diluted, there would have been 4 times the number of cells shown in **Figure 9** which would have made them impossible to count. Just over a quarter of students made any reference to the ease of counting. Some thought the algae would have been easier to see as the murky pond water had been diluted. Some answers were close – stating that dilution reduced the likelihood of cells overlapping – but did not then go on to state that they would thus be easier to count.

07.5 The original information about the scientist's investigation included mention of a thick coverslip over the sample. In this question, information was given about a student trying to repeat the investigation but with a thin coverslip that was pulled downwards slightly, and asking for an explanation of what difference this would make to the cell count. Fewer than half scored any marks and only one in six scored both marks for stating that the volume would be reduced and the cell count therefore also reduced. There were various, highly inventive but incorrect, ideas such as a thinner cover slip allowing light to pass through more easily so more cells would be counted, or that the curved coverslip would somehow refract the light and alter the count as a result. Many stated that the cell count would be 'altered' without being more specific about the direction of this alteration.