

OXFORD

**INTERNATIONAL
AQA EXAMINATIONS**

INTERNATIONAL GCSE COMBINED SCIENCE 9204/BC

Paper 1 Biology Core

Mark scheme

June 2019

Version: 1.0 Final



J U N 1 9 9 2 0 4 B C / M S

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' 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 from oxfordaqaexams.org.uk

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

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Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	group of organs that perform a (particular) function	allow with the same function	1	AO1 3.1.2.d
			1	
01.2	(A) stomach (B) large intestine		1	AO1 3.2.3.a
			1	
01.3	lipase fatty acids	in this order	1	AO1 3.2.3.c
			1	
01.4	up to 40(°C) rate of reaction increased after 40(°C) rate of reaction decreased	allow enzyme stopped working at 50(°C) allow rate of reaction increases <u>and</u> then decreases at a faster rate for 2 marks allow went up and down for 1 mark	1	AO2 3.2.3.b
			1	
01.5	anomalous result	allow outlier allow does not fit the pattern	1	AO3 3.2.3.b
01.6	(enzyme) denatured or active site changed shape	do not accept (enzyme) killed	1	AO2 3.2.3.b
Total			10	

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Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	protects the lungs / heart	allow breathing	1	AO1 3.2.4.a
02.2	contracts / flattens / moves down		1	AO1 3.2.4.b
02.3	4 (breaths in 20 seconds)	an answer of 12 (breaths per minute) scores 2 marks	1	AO2 3.2.5.g
	4 × 3 = 12 (breaths per minute)	allow 8 x 3 = 24 for 1 mark	1	
02.4	fluctuations greater than 0.5 l		1	AO2 3.2.5.g
	more than 4 fluctuations in 20 s		1	
02.5	any one from <ul style="list-style-type: none"> • age • health • fitness 	allow other correct factor	1	AO3 3.2.5.g
Total			7	

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Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	any one from <ul style="list-style-type: none"> • find food • avoid predators • prevents drying out 	allow maintain temperature	1	AO2 3.3.2.f
03.2	nervous system		1	AO1 3.4.1.a
03.3	any one from <ul style="list-style-type: none"> • same time interval between touches • same 'type' of touch • touch with the same object 	allow description allow description	1	AO4 3.3.2.f
03.4	any two from <ul style="list-style-type: none"> • touch worm gently • keep Petri dish damp • provide food • provide oxygen / air • (appropriate) temperature 	allow low light conditions	2	AO4 3.2.2.f
03.5	habituation		1	AO2 3.4.5.c
03.6	to save energy		1	AO2 3.4.5.c

03.7	less food for birds / other animals less decomposition	allow soil is not aerated or soil contents are not mixed allow decomposing material accumulates	1 1	AO3 3.3.2.a
Total			9	

Question	Answers	Extra information	Mark	AO / Spec. Ref.									
04.1	any one from: <ul style="list-style-type: none"> • light • water • minerals • disease • space • temperature • pollution 		1	AO2 3.5.3.a									
04.2	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td></td> <td>R</td> <td>r</td> </tr> <tr> <td>R</td> <td>RR</td> <td>Rr</td> </tr> <tr> <td>r</td> <td>Rr</td> <td>rr</td> </tr> </table>		R	r	R	RR	Rr	r	Rr	rr	2 marks for all 4 derivations correct 1 mark for 2 or 3 derivations correct	2	AO2 3.5.3.g
	R	r											
R	RR	Rr											
r	Rr	rr											
04.3	homozygous for r (allele) or no R (allele)	allow only r present in parents/offspring	1	AO2 3.5.3.g									
04.4	eating GM crops may affect human health the effect of GM crops on wild flowers is not known		1 1	AO1 3.5.5.f									

04.5	Level 2: Relevant reasons are identified, and there are attempts at logical linking. The resulting account is not fully clear.		3–4	AO3 3.5.5.d/e
	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 <ul style="list-style-type: none"> • greater chance of crop surviving • fewer insects / pests to eat the crops • (fewer insects means) less leaf damage • more photosynthesis/glucose • more nutrients for growth not fighting disease • crops grown in more places • not affected by global warming • can be grown at any time of the year • weed-killers can be used without affecting crops • (fewer weeds means) less competition for space/minerals/light • more (photosynthesis/) growth • more nutritious food produced 			
04.6	chromosomes are copied before the cell divides		1	AO1 3.5.2.e
	the new cells are genetically identical		1	
04.7	DNA		1	AO1 3.5.3.h
Total			13	

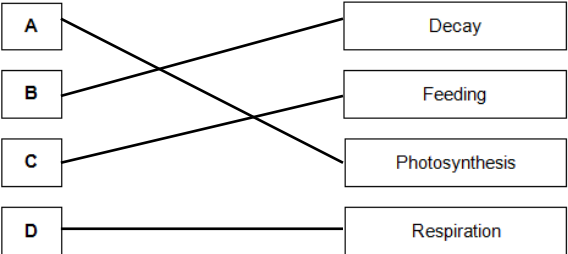
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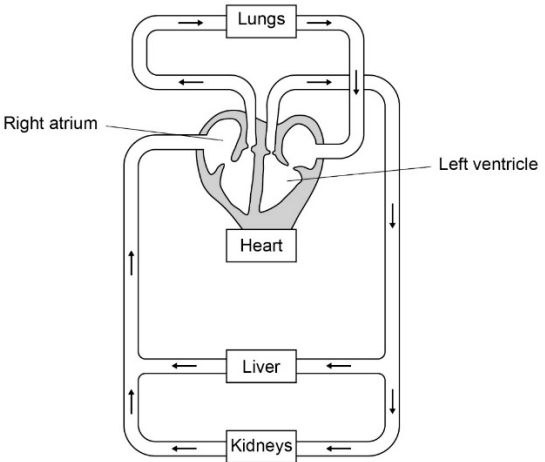
Question	Answers	Extra information	Mark	AO / Spec. Ref.															
05.1	dropping an unexpectedly hot object		1	AO2 3.4.1.c															
05.2	322 (ms)		1	AO2 3.4.1.a															
05.3	first 2 responses (in test 1) are higher than the others because she got better with practice		1 1	AO3 3.4.1.a															
05.4	<table border="1"> <thead> <tr> <th>Change</th> <th>Control</th> <th>Measure</th> </tr> </thead> <tbody> <tr> <td>✓</td> <td></td> <td></td> </tr> <tr> <td></td> <td>✓</td> <td></td> </tr> <tr> <td></td> <td></td> <td>✓</td> </tr> <tr> <td></td> <td>✓</td> <td></td> </tr> </tbody> </table>	Change	Control	Measure	✓				✓				✓		✓		all 4 correct scores 3 marks 3 correct scores 2 marks 1/2 correct scores 1 mark	3	AO4 3.4.1
Change	Control	Measure																	
✓																			
	✓																		
		✓																	
	✓																		
05.5	older people have a slower reaction time	allow converse	1	AO3 3.4.1.a															
05.6	to minimise the effect of anomalies / variation or not everyone in the same age group has the same reaction time or to calculate a mean	allow a particular older person may have faster reaction time than a young person	1	AO3 3.6.1															
Total			9																

Question	Answers	Extra information	Mark	AO / Spec. Ref.																				
06.1	<table border="1" data-bbox="304 360 1008 616"> <thead> <tr> <th></th> <th>Cell</th> <th>Tissue</th> <th>Organ</th> </tr> </thead> <tbody> <tr> <td>Gamete</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>Leaf</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>Phloem</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>Root</td> <td></td> <td></td> <td>✓</td> </tr> </tbody> </table>		Cell	Tissue	Organ	Gamete	✓			Leaf			✓	Phloem		✓		Root			✓		1 1 1	AO1 3.1.4.a/b; 3.5.3.b
	Cell	Tissue	Organ																					
Gamete	✓																							
Leaf			✓																					
Phloem		✓																						
Root			✓																					
06.2	<p>(similarity) any one from</p> <ul style="list-style-type: none"> • cell wall • cytoplasm • DNA • cell membrane • ribosomes <p>(difference) spirogyra has any one from</p> <ul style="list-style-type: none"> • nucleus • chloroplast • no plasmid • vacuole 	allow converse	1 1	AO2 3.1.1.b/c																				
06.3	photosynthesis has a chloroplast		1 1	AO2 3.1.1.b, 3.2.1.b																				

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06.4	nucleus chromosome gene	in this order for 2 marks allow 1 mark for chromosome gene nucleus or gene nucleus chromosome	2	AO2 3.5.3.c/i 3.1.2
06.5	C		1	AO2 3.1.2
06.6	A, D		1	AO2 3.1.2
Total			11	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1		all 4 correct – 3 marks 2/3 correct – 2 marks 1 correct – 1 mark	3	AO2 3.3.3.e
07.2	$\frac{60}{150} (\times 100)$ 40(%)	an answer of 40(%) scores 2 marks	1 1	AO2 3.3.3.e
07.3	150 (billion tonnes) added 140 (billion tonnes) removed	an answer of 10 billion tonnes more added than removed scores 2 marks if no other mark awarded allow more carbon is added than is removed for 1 mark	1 1	AO3 3.3.3.e
07.4	any three from <ul style="list-style-type: none"> • used in respiration • used to make starch • used to make fat • used to make cellulose • used to make protein 	if neither awarded allow used to make storage molecules for 1 mark if no other mark awarded allow reference to plant growth for 1 mark	3	AO1 3.2.1.d, 3.3.3.e
Total			10	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.1	 <p>The diagram illustrates the human circulatory system. At the center is the heart, divided into four chambers: the right atrium (top left), right ventricle (top right), left atrium (bottom left), and left ventricle (bottom right). Arrows indicate the direction of blood flow. The pulmonary circuit shows blood flowing from the right ventricle to the lungs and back to the right atrium. The systemic circuit shows blood flowing from the left ventricle to the liver and kidneys, and back to the left atrium.</p>	<p>if neither mark awarded allow correct labels to an atrium <u>and</u> a ventricle for 1 mark</p>	2	AO1 3.2.2.c
08.2	pulmonary vein		1	AO1 3.2.2.e

08.3	two separate circulation systems or (because) blood through heart twice in one circulation of the body		1	AO1 3.2.2.b/e
	one for lungs and one for other organs	allow named organs	1	
08.4	urea carried in plasma		1	AO1/AO2 3.2.2.a/e/i
	(liver) → heart → lungs → heart → (kidneys) or from liver in a vein <u>and</u> to kidney in an artery		1	
	at least one correctly named blood vessel	eg vena cava, pulmonary artery, pulmonary vein, aorta	1	
08.5	fatty deposits block the (coronary) artery		1	AO2 3.2.2.e/j 3.2.5.f
	less / no oxygen / glucose to heart muscle cells	allow O ₂ do not accept O ² / O2	1	
	less / no respiration/energy	do not accept (less) energy produced	1	
	so heart (muscle cells) can't contract or heart muscle cells die		1	
Total			12	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.1	squeezing rate will have an effect	must include independent and dependent variable for 2 marks	1	AO2 3.2.5.1
	on the length of time before muscle fatigue occurs	allow on the length of time squeezing can continue	1	
09.2	Level 2: The plan would not necessarily lead to a valid outcome. Most steps are identified, but the plan is not fully logically sequenced.		3–4	AO1 3.2.5.1
	Level 1: The plan would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.		1–2	
	No relevant content		0	
	Indicative content <ul style="list-style-type: none"> • apparatus - stopwatch and hand exerciser • use dominant hand • fully squeeze handles of exerciser in and out • squeeze at a rate of 1 repetition every 3 seconds/ described rate • record the time it takes for hand to get fatigued • repeats • rest period between trials • range of at least 4 more rates of repetition 			
09.3	bar graph	do not accept line graph	1	AO2 3.2.5.1
	all plotting correct	1 mark if one error 0 marks if more than 1 error.	2	

09.4	increase in squeezing rate caused muscles to fatigue faster		1	AO3 3.2.5.1
Total			10	

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Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.1	carbon dioxide	word takes precedence allow CO ₂ ignore CO ² / CO2	1	AO1 3.2.5.m
10.2	to keep oxygen / air out of the solution		1	AO4 3.2.5
10.3	monitor water bath temperature	allow use thermometer	1	AO4 3.2.5
	add hot / cold water (to maintain 30°C)	allow use Bunsen burner or water bath (to warm up)	1	
10.4	so all the oxygen is used up or so no aerobic respiration or so yeast are respiring anaerobically	allow idea of yeast acclimatising	1	AO3 3.2.5
10.5	sucrose		1	AO3 3.2.5.m
	most air bubbles (per min so bread rises more)		1	
10.6	(high temperature) kills the yeast or (high temperature) denatures enzymes (in the yeast)		1	AO2/AO3 3.2.5
	so no more respiration / CO ₂ produced		1	
Total			9	