

# GCSE

## Biology A

---

**Session:** 2010 June  
**Type:** Mark scheme  
**Code:** J633  
**Units:** A221; A222; A223

**Biology A**

General Certificate of Secondary Education **A221/01**

Unit 1: Modules B1, B2, B3

**Mark Scheme for June 2010**

---

Archives &  
Heritage

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

© OCR 2010

Any enquiries about publications should be addressed to:

OCR Publications  
PO Box 5050  
Annesley  
NOTTINGHAM  
NG15 0DL

Telephone: 0870 770 6622  
Facsimile: 01223 552610  
E-mail: [publications@ocr.org.uk](mailto:publications@ocr.org.uk)

## Guidance for Examiners

Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, e.g. mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

/	= alternative and acceptable answers for the same marking point
(1)	= separates marking points
<b>not/reject</b>	= answers which are not worthy of credit
<b>ignore</b>	= statements which are irrelevant - applies to neutral answers
<b>allow/accept</b>	= answers that can be accepted
(words)	= words which are not essential to gain credit
<u>words</u>	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW/owtte	= alternative wording
ORA	= or reverse argument

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)  
work done = 0 marks  
work done lifting = 1 mark  
change in potential energy = 0 marks  
gravitational potential energy = 1 mark

5. Annotations:

The following annotations are available on SCORIS.

✓	= correct response
✗	= incorrect response
bod	= benefit of the doubt
nbod	= benefit of the doubt <b>not</b> given
ECF	= error carried forward
^	= information omitted
I	= ignore
R	= reject

6. If a candidate alters his/her response, examiners should accept the alteration.
7. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

E.g.

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth one mark.

Put ticks (✓) in the two correct boxes.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth one mark.

8. The list principle:

If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, e.g. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

9. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

E.g. If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question			Expected Answers	Marks	Additional Guidance
1	a		nucleus (1)	[1]	<b>accept</b> phonetic spelling <b>accept</b> indication on diagram
	b		to store glucose from digestion <input type="checkbox"/> to describe how to make proteins <input checked="" type="checkbox"/> (1) to release energy by respiration <input type="checkbox"/> to transport materials around the cell <input type="checkbox"/>	[1]	if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc
	c		... very long DNA molecules ... <input checked="" type="checkbox"/> (1) ... very short DNA molecules ... <input type="checkbox"/> ... very short chromosomes ... <input type="checkbox"/> ... very long chromosomes ... <input type="checkbox"/>	[1]	if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc
			<b>Total</b>	<b>[3]</b>	

Question			Expected Answers	Marks	Additional Guidance
2	a		23 (1)	[1]	<b>accept</b> underline, tick, all four distractors crossed out
	b		both from her mother <input type="checkbox"/> both from her father <input type="checkbox"/> neither ... <input type="checkbox"/> one from ... .. and one from ... <input checked="" type="checkbox"/> (1)	[1]	if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc
	c		... one dominant allele. <input type="checkbox"/> ... two dominant alleles. <input type="checkbox"/> ... one recessive allele. <input type="checkbox"/> ... two recessive alleles. <input checked="" type="checkbox"/> (1) ... one ... .. and one ... <input type="checkbox"/>	[1]	if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc
			<b>Total</b>	<b>[3]</b>	
3			discussion of privacy issue eg right to know vs right not to tell (1) any correct statement to Amrit (1) any correct statement to Raj (1)	[3]	responses must clearly indicate Amrit/employee or Raj/ employer
			<b>Total</b>	<b>[3]</b>	

Question			Expected Answers	Marks	Additional Guidance
4	a		<p>... using high frequency sound. <input type="checkbox"/></p> <p>... engulfing them. <input checked="" type="checkbox"/></p> <p>... drowning them. <input type="checkbox"/></p> <p>... digesting them. <input checked="" type="checkbox"/></p> <p>... making antibodies. <input checked="" type="checkbox"/></p> <p>... using an electrical impulse. <input type="checkbox"/></p> <p>... making antigens. <input type="checkbox"/></p> <p>... using high speed collisions. <input type="checkbox"/></p> <p>... injecting them with hormones. <input type="checkbox"/></p>	[2]	<p>3 correct responses = 2 marks</p> <p>2 or 1 correct responses = 1 mark</p> <p>if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc</p>



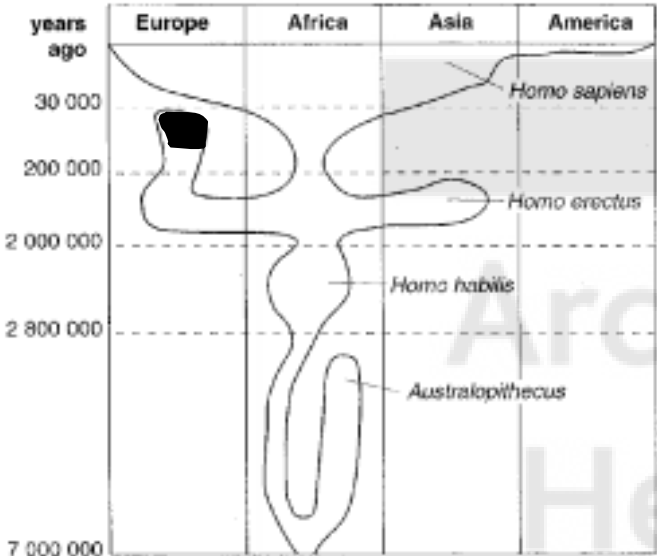
Question			Expected Answers	Marks	Additional Guidance
4	b		<p>presence of nitrogen gas <input type="checkbox"/></p> <p>acidic <input type="checkbox"/></p> <p>cold <input type="checkbox"/></p> <p>wet <input type="checkbox"/> (1)</p> <p>presence of food <input type="checkbox"/> (1)</p> <p>dry <input type="checkbox"/></p> <p>warm <input checked="" type="checkbox"/> (1)</p> <p>presence of carbon dioxide <input type="checkbox"/></p>	[3]	if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc
	c		<p><b>any three from:</b></p> <p>saliva – enzymes/chemicals;</p> <p>sweat - acidic / chemicals;</p> <p>tears - enzymes / chemicals;</p> <p><u>stomach</u> – acid;</p> <p>mucous/wax – traps microorganisms;</p>	[3]	<p>name of barrier <b>must</b> be linked to correct method of operating</p> <p><b>allow</b> 'clots and scabs covering wounds'</p> <p><b>ignore</b> non-biological names</p> <p><b>ignore</b> gut</p>
			<b>Total</b>	[8]	

Question			Expected Answers	Marks	Additional Guidance								
5	a		<div>smoke cigarettes<div><input type="checkbox"/></div></div> <div>exercise regularly<div><input checked="" type="checkbox"/> (1)</div></div> <div>drink a lot of alcohol<div><input type="checkbox"/></div></div> <div>have a poor diet<div><input type="checkbox"/></div></div> <div>reduce his stress level<div><input checked="" type="checkbox"/> (1)</div></div>	[2]	if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc								
	b		artery; decrease; oxygen; heart;	[2]	all four correct = 2 marks two or three correct = 1 mark one correct = 0 marks  <b>accept</b> clear deletion of incorrect alternative								
	c		<table><tr><th>high risk</th><th>low risk</th></tr><tr><td>C</td><td>A</td></tr><tr><td></td><td>B</td></tr><tr><td></td><td>D</td></tr></table>	high risk	low risk	C	A		B		D	[2]	four correct = 2 marks three or two correct = 1 mark  <b>ignore</b> same letter in both boxes the letters must be clear
high risk	low risk												
C	A												
	B												
	D												
			Total	[6]									

Question			Expected Answers	Marks	Additional Guidance
6	a		Peter (1)	[1]	
	b		Ranjit (1)	[1]	
	c		Stella (1)	[1]	
	d		Jane <b>and</b> Ranjit (1)	[1]	either way round
			<b>Total</b>	<b>[4]</b>	

7				[2]	<p>three correct lines = 2 marks  two correct lines = 1 mark  one correct line only = 0 marks</p> <p>more than three lines – deduct 1 mark for each additional line</p>
			<b>Total</b>	<b>[2]</b>	

Question			Expected Answers	Marks	Additional Guidance
8	a		<p>... Dead Sea Scrolls <input type="checkbox"/></p> <p>stories ... <input type="checkbox"/></p> <p>the fossil record <input checked="" type="checkbox"/> (1)</p> <p>... on other planets <input type="checkbox"/></p> <p>... in DNA <input checked="" type="checkbox"/> (1)</p> <p>... internet ... <input type="checkbox"/></p>	[2]	if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc
	b		could; natural;	[1]	two correct = 1 mark <b>accept</b> clear deletion of incorrect alternative
	c		<b>some</b> species find it hard to survive / become extinct (1) new adaptations become favourable (1)	[2]	one mark is for differential survival / or clear named example a second mark for some being better adapted
			<b>Total</b>	[5]	

Question			Expected Answers	Marks	Additional Guidance
9	a			[1]	shading may be extended into the 'L' shape then give mark shaded area must not extend significantly beyond the L shape shading must not go into central area
	b	i	<p>All ... .. common ancestor. <input checked="" type="checkbox"/> (1)</p> <p>Only one ... .. common ancestor. <input type="checkbox"/></p> <p><i>Australopithecus</i> ... <input type="checkbox"/></p> <p>None ... .. common ancestor. <input type="checkbox"/></p> <p><i>Homo erectus</i> ... <input type="checkbox"/></p>	[1]	if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc

Question			Expected Answers	Marks	Additional Guidance
9	b	ii	<p>... central evolution. <input type="checkbox"/></p> <p>... convergent evolution. <input type="checkbox"/></p> <p>... divergent evolution. <input checked="" type="checkbox"/> (1)</p> <p>... negative evolution. <input type="checkbox"/></p>	[1]	if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc
		iii	<i>Homo sapiens</i> (1)	[1]	<b>accept</b> humans
	c		<p><b>any two from:</b></p> <p>idea that brain got bigger / larger / complex / developed;</p> <p>(better chance of) survival / breeding / pass on genes;</p> <p>idea of intelligence eg brighter / smarter;</p> <p>example of intelligence e.g. using tools / speech / talking / writing / fire ;</p>	[2]	<p><b>ignore</b> live longer</p> <p><b>ignore</b> learning / knowledge / thinking / self aware / memory</p> <p><b>ignore</b> communication / building / hunting / farming / use of hands/ bipedal</p>
	d		<p><b>any two from:</b></p> <p>idea that not enough evidence / data / results;</p> <p>idea of conflicting data/evidence/results / two different explanations or interpretations;</p> <p>loss of sponsorship etc;</p>	[2]	<p><b>ignore</b> reference to God</p> <p><b>ignore</b> arguments about loss of face;</p> <p><b>ignore</b> reference to “thinking you are right”</p> <p><b>ignore</b> no evidence</p> <p><b>ignore</b> reference to different experiments.</p> <p>do <b>not</b> credit specific reference to Darwin or theories of evolution</p>
			<b>Total</b>	[8]	

**OCR (Oxford Cambridge and RSA Examinations)**  
**1 Hills Road**  
**Cambridge**  
**CB1 2EU**

**OCR Customer Contact Centre**

**14 – 19 Qualifications (General)**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://www.ocr.org.uk)**

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Archives &  
Heritage

**Oxford Cambridge and RSA Examinations**  
**is a Company Limited by Guarantee**  
**Registered in England**  
**Registered Office; 1 Hills Road, Cambridge, CB1 2EU**  
**Registered Company Number: 3484466**  
**OCR is an exempt Charity**



**OCR (Oxford Cambridge and RSA Examinations)**  
**Head office**  
**Telephone: 01223 552552**  
**Facsimile: 01223 552553**

**Biology A**

General Certificate of Secondary Education **A221/02**

Unit 1: Modules B1, B2, B3

**Mark Scheme for June 2010**

---

Archives &  
Heritage



OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

© OCR 2010

Any enquiries about publications should be addressed to:

OCR Publications  
PO Box 5050  
Annesley  
NOTTINGHAM  
NG15 0DL

Telephone: 0870 770 6622  
Facsimile: 01223 552610  
E-mail: [publications@ocr.org](mailto:publications@ocr.org)

## Guidance for Examiners

Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, e.g. mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

/	= alternative and acceptable answers for the same marking point
(1)	= separates marking points
<b>not/reject</b>	= answers which are not worthy of credit
<b>ignore</b>	= statements which are irrelevant - applies to neutral answers
<b>allow/accept</b>	= answers that can be accepted
(words)	= words which are not essential to gain credit
<u>words</u>	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW/owtte	= alternative wording
ORA	= or reverse argument

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)  
 work done = 0 marks  
 work done lifting = 1 mark  
 change in potential energy = 0 marks  
 gravitational potential energy = 1 mark

5. Annotations:

The following annotations are available on SCORIS.

✓	= correct response
✗	= incorrect response
bod	= benefit of the doubt
nbod	= benefit of the doubt <b>not</b> given
ECF	= error carried forward
^	= information omitted
I	= ignore
R	= reject

6. If a candidate alters his/her response, examiners should accept the alteration.
7. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

E.g.

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in  
the two correct  
boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be  
worth 0 marks.

Put ticks (✓) in  
the two correct  
boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be  
worth one mark.

Put ticks (✓) in  
the two correct  
boxes.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be  
worth one mark.

8. The list principle:

If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, e.g. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

9. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

E.g. If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question			Expected Answers	Marks	Additional Guidance
1	a		Y (1)	[1]	<b>accept</b> Y or Y with chromosome above
	b		gene causes development of testes (1)	[1]	<b>accept</b> gene codes for/causes production of testosterone/androgens/TDF <b>ignore</b> SRY <b>ignore</b> reference to male sex organs
	c		height (1)	[1]	
			<b>Total</b>	[3]	

2	a		mum <b>and</b> dad (1)	[1]	<b>accept</b> parents <b>reject</b> one of her parents / mum OR dad
	b	i	recessive (1)	[1]	
		ii	A (1)	[1]	
		iii	B, C <b>and</b> E (1)	[1]	three correct = 1 mark <b>accept</b> any order
		iv	we do not know if E has passed on the CF allele (1) we do not know if E's wife has the CF allele / is a carrier (1) if E's wife has got the CF allele we do not know if she's passed it on (1)	[3]	NB "Her mum" = "E's wife"
			<b>Total</b>	[7]	

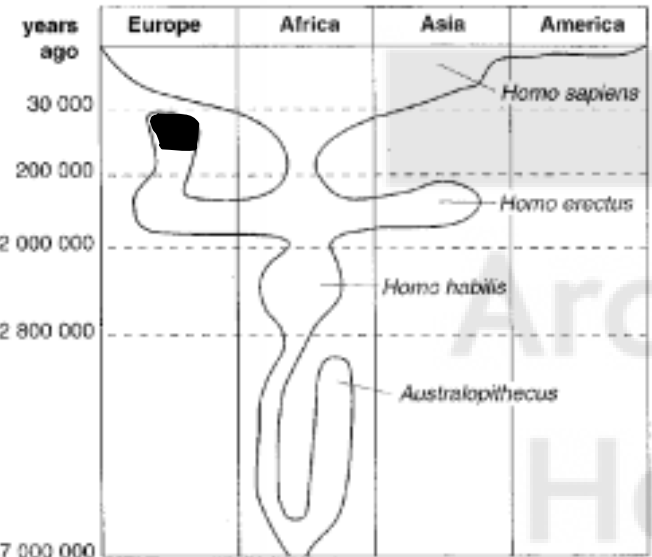
Question		Expected Answers	Marks	Additional Guidance
3	a	<b>any two from:</b> he may not want to know; privacy; may affect his employment prospects; could affect insurance (costs); false neg / false pos / reliability arguments;	[2]	ignore moral or religious answers
	b	any <b>staffing implication</b> answer (1)  any <b>financial implication</b> answer (1)	[2]	eg sacking / redeployment / H&S / suitability of roles <b>ignore</b> to see who is healthy, without implication  eg sickness pay / cost company / loss of production
		<b>Total</b>	[4]	

Question		Expected Answers	Marks	Additional Guidance
4	a	nucleus from a body cell (1)	[1]	
	b	<div> <div>... asexual reproduction ... <input checked="" type="checkbox"/> (✓)</div> <div>... photocopies ... <input type="checkbox"/></div> <div>... bacteria ... <input checked="" type="checkbox"/> (✓)</div> <div>... artist's drawing ... <input type="checkbox"/></div> <div>identical twins <input checked="" type="checkbox"/> (✓)</div> <div>... sperm ... <input type="checkbox"/></div> </div>	[2]	<p>three correct responses = 2 marks two correct responses = 1 mark if more than three boxes ticked then minus 1 mark for each incorrect answer</p> <p><b>allow</b> any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc</p>
	c	environmental factors only (1)	[1]	<b>accept</b> any other indication of correct response
	d	<div> <div>... unspecialised ... ... can develop ... <input checked="" type="checkbox"/> (1)</div> <div>... unspecialised... ... cannot develop ... <input type="checkbox"/></div> <div>... treat diseases. <input checked="" type="checkbox"/> (1)</div> <div>... grow different species ... <input type="checkbox"/></div> <div>... specialised ... ... can develop ... <input type="checkbox"/></div> <div>... specialised ... ... cannot develop ... <input type="checkbox"/></div> </div>	[2]	<p>if more than two boxes ticked then minus 1 mark for each incorrect answer</p> <p><b>allow</b> any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc</p>
		<b>Total</b>	<b>[6]</b>	

Question		Expected Answers	Marks	Additional Guidance
5	a	<div> <div></div> <div>D</div> <div>E</div> <div>C</div> <div>A</div> </div> <p>D before E (1) E before C (1) C before A (1)</p>	[3]	
	b	<p>... hormonal ...    ... high mutation ... <input type="checkbox"/></p> <p>... hormonal ...    ... low mutation ... <input type="checkbox"/></p> <p>... immune ...    ... high mutation ... <input checked="" type="checkbox"/> (1)</p> <p>... immune ...    ... low mutation ... <input type="checkbox"/></p> <p>... nervous ...    ... high mutation ... <input type="checkbox"/></p> <p>... nervous ...    ... low mutation ... <input type="checkbox"/></p> <p>... reproductive ...    ... high mutation ... <input type="checkbox"/></p> <p>... reproductive ...    ... low mutation ... <input type="checkbox"/></p>	[1]	<p>if more than one box ticked then 0 marks</p> <p><b>allow</b> any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc</p>
		<b>Total</b>	<b>[4]</b>	
6	a	Peter (1)	[1]	
	b	Ranjit (1)	[1]	
	c	Stella (1)	[1]	
	d	Jane <b>and</b> Ranjit (1)	[1]	either way round
		<b>Total</b>	<b>[4]</b>	

Question		Expected Answers	Marks	Additional Guidance
7	a	Ben; Louise;	[1]	two correct responses = 1 mark responses must be in the correct order  if no response then open up full screen to check for answers elsewhere
	b	<b>what</b> – inactive / fake / not real drug / look alike / blank (1)  <b>why</b> - to test/compare results / idea of control (1)  <b>when</b> - if health / life of patient would be at risk without effective treatment / if effective treatment is needed(1)	[3]	<b>accept</b> used instead of actual drug  <b>accept</b> to eliminate / control named factors <b>ignore</b> used in drugs trials – as that is in stem <b>ignore</b> to see if illness has a psychological cause  <b>ignore</b> should not be used on sick people <b>ignore</b> ill patients should be given the NEW drug being trialled / should not be given the placebo
		<b>Total</b>	[4]	



Question	Expected Answers	Marks	Additional Guidance
8 a		[1]	<p>shading may be extended into the 'L' shape then give mark</p> <p>shaded area must not extend significantly beyond the L shape</p> <p>shading must not go into central area</p>
b i	<p>All ... .. common ancestor. <input checked="" type="checkbox"/> (1)</p> <p>Only one ... .. common ancestor. <input type="checkbox"/></p> <p><i>Australopithecus</i> ... <input type="checkbox"/></p> <p>None ... .. common ancestor. <input type="checkbox"/></p> <p><i>Homo erectus</i> ... <input type="checkbox"/></p>	[1]	<p><b>allow</b> any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc</p>

Question			Expected Answers	Marks	Additional Guidance
8	b	ii	... central evolution. <input type="checkbox"/> ... convergent evolution. <input type="checkbox"/> ... divergent evolution. <input checked="" type="checkbox"/> (1) ... negative evolution. <input type="checkbox"/>	[1]	allow any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc
		iii	<i>Homo sapiens</i> (1)	[1]	accept humans
	c		<b>any two from:</b> idea that brain got bigger / larger / complex / developed; (better chance of) survival / breeding / pass on genes; idea of intelligence eg brighter / smarter; example of intelligence eg using tools / speech / talking / writing / fire;	[2]	ignore live longer ignore learning / knowledge / thinking / self aware / memory ignore communication / building / hunting / farming / use of hands/ bipedal
	d		<b>any two from:</b> idea that not enough evidence / data / results;  idea of conflicting data/evidence/results / two different explanations, theories or interpretations;  loss of sponsorship etc;	[2]	do not credit specific reference to Darwin or theories of evolution ignore no evidence ignore reference to God ignore arguments about loss of face; ignore reference to "thinking you are right"  ignore reference to different experiments / different ideas.
			<b>Total</b>	[8]	

Question			Expected Answers	Marks	Additional Guidance
9			It proves ... <input type="checkbox"/>	[2]	if more than two boxes ticked then minus 1 mark for each incorrect answer  <b>allow</b> any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc
			It increases ... <input checked="" type="checkbox"/> (1)		
			It makes no difference ... <input type="checkbox"/>		
			It decreases ... <input type="checkbox"/>		
			It agrees with ... <input checked="" type="checkbox"/> (1)		
			It disagrees with ... <input type="checkbox"/>		
			Total	[2]	

**OCR (Oxford Cambridge and RSA Examinations)**  
**1 Hills Road**  
**Cambridge**  
**CB1 2EU**

**OCR Customer Contact Centre**

**14 – 19 Qualifications (General)**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://www.ocr.org.uk)**

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Archives &  
Heritage

**Oxford Cambridge and RSA Examinations**  
**is a Company Limited by Guarantee**  
**Registered in England**  
**Registered Office; 1 Hills Road, Cambridge, CB1 2EU**  
**Registered Company Number: 3484466**  
**OCR is an exempt Charity**



**OCR (Oxford Cambridge and RSA Examinations)**  
**Head office**  
**Telephone: 01223 552552**  
**Facsimile: 01223 552553**

**GCSE**

**Biology A**

General Certificate of Secondary Education **A222/01**

Unit 2: Modules B4, B5, B6 (Foundation Tier)

## **Mark Scheme for June 2010**

---

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

© OCR 2010

Any enquiries about publications should be addressed to:

OCR Publications  
PO Box 5050  
Annesley  
NOTTINGHAM  
NG15 0DL

Telephone: 0870 770 6622  
Facsimile: 01223 552610  
E-mail: [publications@ocr.org.uk](mailto:publications@ocr.org.uk)

Question		Expected Answers				Marks	Additional Guidance
1	a	proteins (1) speed up (chemical) reactions / OWTTE (1)				[2]	eg make reactions faster <b>accept</b> are catalysts as an alternative to speed up reactions
	b	lock and key model (1)				[1]	more than one response = 0 marks <b>accept</b> any clear indication eg underlining
	c	i	<div><div><input type="checkbox"/></div><div><input type="checkbox"/></div><div><input checked="" type="checkbox"/> (1)</div></div> temperature			[1]	more than one response = 0 marks <b>accept</b> any clear indication of the correct answer only
		ii	increase / OWTTE (1)			[1]	eg be faster/speed up/ <u>be</u> higher <b>not</b> higher on its own
		Total				[5]	

2	a	<table><tr><td>chemical</td><td>completely</td><td>partly</td><td>not</td></tr><tr><td>water</td><td></td><td>✓</td><td></td></tr><tr><td>sugar</td><td>✓</td><td></td><td></td></tr><tr><td>urea</td><td></td><td>✓</td><td>✓</td></tr></table>	chemical	completely	partly	not	water		✓		sugar	✓			urea		✓	✓	[3]	look at the responses to each of the three rows each correct row = 1 mark  <b>allow</b> urea tick in middle <b>or</b> right-hand column but not in both more than one response in any row = 0 marks for that row  <b>accept</b> any clear indication of the correct answer only
chemical	completely	partly	not																	
water		✓																		
sugar	✓																			
urea		✓	✓																	
	b	volume (of urine produced) increases / OWTTE (1)  concentration (of urine produced) is more dilute (1)  the water levels in the blood/body fall (1)		[3]	eg more urine produced <b>not</b> urinate more <b>accept</b> concentration is weaker <b>ignore</b> references to colour changes in urine <b>accept</b> body is dehydrated/becomes dehydrated															
		Total		[6]																

Question			Expected Answers	Marks	Additional Guidance
3	a	i	the maintenance of a constant internal environment / OWTTE (1)	[1]	<b>accept</b> 'inside body' = internal environment <b>ignore</b> references to internal temperature
		ii	energy gain is the same as energy loss / OWTTE (1)	[1]	<b>accept</b> 'input' = gain, 'output' = loss <b>accept</b> 'they are the same'/balanced <b>accept</b> 'it' = energy gain
	b		receptors (1) skin (1) brain (1)	[3]	if more than three responses, deduct 1 mark for each additional response candidate cannot score less than zero marks <b>accept</b> clear indication of correct response eg use of arrows
	c		respiration (1)	[1]	<b>accept</b> a clear indication of correct response eg underlined, other options deleted more than one response ticked = 0 marks
			<b>Total</b>	[6]	

4	a		increases (1) DNA (1)	[2]	responses must be in the correct order <b>accept</b> an arrow from correct word to correct space
	b		23 (1)	[1]	more than one response = 0 marks <b>accept</b> any clear indication of the correct answer only eg underlining, tick etc
			<b>Total</b>	[3]	



Question			Expected Answers	Marks	Additional Guidance
5	a		<div style="text-align: right;"> <input type="checkbox"/>  <input type="checkbox"/>  Only some ... .. remain active. <input checked="" type="checkbox"/> (1)  <input type="checkbox"/> </div>	[1]	more than one response = 0 marks <b>accept</b> any clear indication of the correct response only
	b		hormones (1)	[1]	more than one response = 0 marks <b>accept</b> any clear indication of the correct response only
	c		<div style="text-align: right;"> ... have specialised cells. <input checked="" type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  ... make specific proteins ... <input checked="" type="checkbox"/> </div>	[1]	both answers need to be correct to gain 1 mark more than 2 responses = 0 marks <b>accept</b> any clear indication of the correct response only
			<b>Total</b>	<b>[3]</b>	

Question			Expected Answers					Marks	Additional Guidance
6	a							[1]	more than one response in each box = 0 marks <b>accept</b> any clear indication of correct responses eg use of linking arrows with diagram, correct description alongside label on diagram (A = genetic code, B = proteins) or nucleus = A, cytoplasm = B within the box
			description			label			
			where the genetic code is found			A			
			where proteins are made			B			
	b							[3]	four <b>rows</b> correct = 3 marks three <b>rows</b> correct = 2 marks one or two <b>rows</b> correct = 1 mark  more than one response in a row, deduct 1 mark  <b>accept</b> any clear indication of correct response eg tick, other options crossed out, clearly underlined, shaded
			DNA ...						
			... strands	1	2	3	4		
			... bases	2	3	4	5		
			... bases ...	single	pairs	triplets	fours		
			shape ...	circular	cubic	helix	zig-zag		
			Total					[4]	

Question			Expected Answers	Marks	Additional Guidance
7	a		brain (1)	[1]	more than one response = 0 marks <b>accept</b> any clear indication of the correct response only
	b		<div> <input type="checkbox"/> </div> <div> <input type="checkbox"/> </div> <div> ... storage and retrieval .. <input checked="" type="checkbox"/> (1) </div> <div> <input type="checkbox"/> </div>	[1]	more than one response = 0 marks <b>accept</b> any clear indication of the correct response only
	c		<div> <input type="checkbox"/> </div> <div> short-term and long-term ... <input checked="" type="checkbox"/> (1) </div> <div> <input type="checkbox"/> </div> <div> <input type="checkbox"/> </div>	[1]	more than one response = 0 marks <b>accept</b> any clear indication of the correct response only
	d		brain new	[1]	two correct responses = 1 mark responses must be in the correct order <b>accept</b> arrow from correct word to correct space
			<b>Total</b>	<b>[4]</b>	

Question		Expected Answers	Marks	Additional Guidance
8	a	protect itself (1)	[1]	<b>accept</b> stop itself being eaten/becoming prey / stop things trying to eat it / to avoid predators or predation <b>ignore</b> camouflage / hiding <b>ignore</b> references to damage unless referring to being eaten
	b	<b>any two from:</b> grasping; sucking; startle reflex eg jumping when they hear a noise; plantar (foot curling); rooting reflex eg turning its head in response to cheek being stroked; pupil reflex;	[2]	<b>not</b> blinking <b>not</b> crying <b>not</b> pupils dilating unless qualified <b>not</b> reacts to sound
	c	brain (1) spinal cord (1)	[2]	if more than 2 responses deduct 1 mark for each additional response <b>accept</b> any clear indication of the two correct responses
		<b>Total</b>	[5]	

Question			Expected Answers	Marks	Additional Guidance
9	a		light sensory	[1]	both responses in the correct order needed for the mark <b>accept</b> clear indication of correct response eg use of arrows
	b		moving away from fire is voluntary (1) jumping (in response to the spark) is involuntary (1)	[2]	<b>accept</b> for 1 mark a general statement explaining what is meant by voluntary and involuntary reflexes eg voluntary is something you choose to do whilst involuntary is something you cannot control/automatic examples used in response must be from the stem of the question
	c	i	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">membrane</div> <div style="display: flex; flex-direction: column; gap: 5px;"> <input type="checkbox"/>  <input checked="" type="checkbox"/> (1)  <input type="checkbox"/>  <input type="checkbox"/> </div> </div>	[1]	more than one response = 0 marks <b>accept</b> any clear indication of correct response eg other options crossed out, clearly underlined, shaded, circled <b>accept</b> cross – only without ticks more than one response = 0 marks
		ii	<b>insulates</b> the neuron (from surrounding cells) / OWTTE (1) <b>increases</b> the speed of the transmission of a nerve impulse (1)	[2]	<b>ignore</b> stops interference from surrounding cells  <b>accept</b> a clear reference to saltatory response / jumping of impulse = increased speed of transmission <b>accept</b> sends information more quickly.
			<b>Total</b>	[6]	

**OCR (Oxford Cambridge and RSA Examinations)**  
**1 Hills Road**  
**Cambridge**  
**CB1 2EU**

**OCR Customer Contact Centre**

**14 – 19 Qualifications (General)**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://www.ocr.org.uk)**

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Archives &  
Heritage

Oxford Cambridge and RSA Examinations  
is a Company Limited by Guarantee  
Registered in England  
Registered Office; 1 Hills Road, Cambridge, CB1 2EU  
Registered Company Number: 3484466  
OCR is an exempt Charity



OCR (Oxford Cambridge and RSA Examinations)  
Head office  
Telephone: 01223 552552  
Facsimile: 01223 552553

© OCR 2010

**Biology A**

General Certificate of Secondary Education **A222/02**

Unit 2: Modules B4, B5, B6 (Higher Tier)

**Mark Scheme for June 2010**

---

Archives &  
Heritage

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

© OCR 2010

Any enquiries about publications should be addressed to:

OCR Publications  
PO Box 5050  
Annesley  
NOTTINGHAM  
NG15 0DL

Telephone: 0870 770 6622  
Facsimile: 01223 552610  
E-mail: [publications@ocr.org.uk](mailto:publications@ocr.org.uk)



Question			Expected Answers	Marks	Additional Guidance
1	a	i	the maintenance of a constant internal environment (1)	[1]	OWTTE <b>Accept</b> 'inside body' = internal environment <b>Ignore</b> references to internal temperature
		ii	energy gain is the same as energy loss (1)	[1]	OWTTE <b>Accept</b> 'input' = gain, 'output' = loss <b>Accept</b> 'they are the same'/balanced <b>Accept</b> 'it' = energy gain
	b		receptors (1) skin (1) brain (1)	[3]	if more than three responses, deduct one mark for each additional response candidates cannot score less than zero marks <b>accept</b> clear indication of correct response eg use of arrows
	c		respiration (1)	[1]	more than one response = 0 marks <b>accept</b> a clear indication of correct response eg underlined, other options deleted, tick
			<b>Total</b>	<b>[6]</b>	

2	a			[1]	three correct lines = 1 mark  more than one line from left hand boxes = 0 marks
	b		<b>mechanism/process</b> use of a feedback loop/changes being reversed (1) <b>outcome</b> (conditions kept) constant / creates a balance / (establish a) set point/normal level (1) <b>detail within the process</b> (created due to action of) antagonistic effectors / OWTTE (1)	[3]	<b>accept</b> correct scenario details for artificial systems – look for key marking points
			<b>Total</b>	<b>[4]</b>	

Question		Expected Answers	Marks	Additional Guidance
3	a	eating food (1) respiring (1)	[2]	if more than two responses – deduct 1 mark for each additional response <b>Accept</b> a clear indication of correct response eg. underlined, other options deleted, tick
	b i	pituitary gland (1)	[1]	if more than one response = 0 marks <b>Accept</b> a clear indication of correct response eg. underlined, other options deleted, tick
	ii	<b>any three from:</b> more water in blood <u>less</u> ADH produced; <u>less</u> water <u>reabsorbed</u> by kidneys; (type of) urine produced is <u>more</u> dilute/ <u>lower</u> concentration; water level returns to normal;	[3]	responses must be in context of <b>excess water</b> <b>ignore</b> account of ADH under conditions of low water intake
Total			[6]	

4	a	<table><tr><td colspan="2">description</td><td>label</td></tr><tr><td colspan="2">where the genetic code is found</td><td>A</td></tr><tr><td colspan="2">where proteins are made</td><td>B</td></tr></table>	description		label	where the genetic code is found		A	where proteins are made		B	[1]	more than one response in each box = 0 marks <b>accept</b> a clear indication of correct response eg use of linking arrows with diagram, correct description alongside label on diagram (A = genetic code, B = proteins) or nucleus = A, cytoplasm = B within the box																
description		label																											
where the genetic code is found		A																											
where proteins are made		B																											
	b	<table><tr><td colspan="5">DNA ...</td></tr><tr><td>... strands</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>... bases</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>... bases ...</td><td>single</td><td>pairs</td><td>triplets</td><td>fours</td></tr><tr><td>shape ...</td><td>circular</td><td>cubic</td><td>helix</td><td>zig-zag</td></tr></table>	DNA ...					... strands	1	2	3	4	... bases	2	3	4	5	... bases ...	single	pairs	triplets	fours	shape ...	circular	cubic	helix	zig-zag	[3]	four <b>rows</b> correct = 3 marks three <b>rows</b> correct = 2 marks one or two <b>rows</b> correct = 1 mark  more than one response in a row means that this row is incorrect  <b>accept</b> any clear indication of correct response eg tick, other options crossed out, clearly underlined, shaded
DNA ...																													
... strands	1	2	3	4																									
... bases	2	3	4	5																									
... bases ...	single	pairs	triplets	fours																									
shape ...	circular	cubic	helix	zig-zag																									
		Total	[4]																										

Question			Expected Answers	Marks	Additional Guidance															
5	a		Jo and Ray (1)	[1]	two correct responses = 1 mark more than two responses = 0 marks <b>accept</b> responses in either order <b>accept</b> linking arrows to correct people on the diagram															
	b		a set of chromosomes / different genes from <b>each parent</b> (1)	[1]	<b>ignore</b> reference to 50% chromosomes/ 'information' <b>accept</b> alleles/DNA															
	c	i	organelles (1) eight (1)	[2]	if more than two responses, deduct 1 mark for each additional response candidate cannot score less than zero marks responses must be in the correct order <b>accept</b> linking arrows to correct words in list															
		ii	<table><tr><td></td><td>true</td><td>false</td></tr><tr><td>The cells no longer contain the same genes.</td><td></td><td>✓</td></tr><tr><td>Some of the genes are no longer active.</td><td>✓</td><td></td></tr><tr><td>Each cell produces only the specific proteins it needs.</td><td>✓</td><td></td></tr><tr><td>The cells form different types of tissues.</td><td>✓</td><td></td></tr></table>		true	false	The cells no longer contain the same genes.		✓	Some of the genes are no longer active.	✓		Each cell produces only the specific proteins it needs.	✓		The cells form different types of tissues.	✓		[2]	four rows correct = 2 marks three rows correct = 1 mark two or one rows correct = 0 marks  <b>accept</b> a clear indication of correct response eg shaded, circled, crosses (if no ticks)
	true	false																		
The cells no longer contain the same genes.		✓																		
Some of the genes are no longer active.	✓																			
Each cell produces only the specific proteins it needs.	✓																			
The cells form different types of tissues.	✓																			
			Total	[6]																

Question			Expected Answers	Marks	Additional Guidance
6	a		meristem (1)	1	more than one response = 0 marks <b>accept</b> a clear indication of correct response eg underlined, other options deleted, tick
	b		auxin (1)	1	more than one response = 0 marks <b>accept</b> a clear indication of correct response eg underlined, other options deleted, tick
	c		stays the same unspecialised genes	2	three correct = 2 marks two correct = 1 mark one or zero correct = 0 marks if more than three responses – deduct 1 mark for each additional response candidate cannot score less than zero marks <b>accept</b> clear indication of correct response eg use of arrows
			<b>Total</b>	<b>[4]</b>	

7	a		light sensory	1	need both responses in the correct order <b>accept</b> clear indication of correct response eg use of arrows
	b	i	<div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 10px;">membrane</div> <div style="display: flex; flex-direction: column; gap: 10px;"> <input type="checkbox"/>  <input checked="" type="checkbox"/> (1)  <input type="checkbox"/>  <input type="checkbox"/> </div> </div>	1	more than one response = 0 marks  <b>accept</b> a clear indication of correct response eg other options crossed out, clearly underlined, shaded, circled, crosses (if no ticks)
		ii	<b>insulates</b> the neuron (from surrounding cells) (1) increases the <b>speed</b> of the transmission of a nerve impulse (1)	2	<b>ignore</b> 'stops interference' from surrounding cells <b>accept</b> sends information more quickly <b>accept</b> a clear reference to saltatory response / jumping of impulse = increased speed of transmission
			<b>Total</b>	<b>[4]</b>	

Question		Expected Answers	Marks	Additional Guidance
8	a	<div style="border: 1px solid black; display: inline-block; padding: 2px;">F</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">A</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">D</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">C</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">E</div>	2	<b>F</b> before <b>A</b> <b>A</b> before <b>D</b> <b>D</b> before <b>C</b>  three correct steps = 2 marks one or two correct steps = 1 mark zero correct steps = 0 marks  if <b>B</b> is included in overall response, continue to mark and look for sequence eg <b>F</b> before <b>A</b>
	b	the sensory neuron membrane does not contain the chemical receptor (binding sites) / OWTTE (1)	1	
	c	serotonin <b>not reabsorbed</b> (by pre synaptic vesicles) / serotonin reabsorption site is <b>blocked</b> (1)	1	<b>ignore</b> 'serotonin stays in synapse'
		<b>Total</b>	<b>[4]</b>	

Question			Expected Answers	Marks	Additional Guidance												
9	a		<div><div>B</div><div></div><div></div></div>	2	B before C (1 mark), C before A (1 mark)  if more than two responses, deduct 1 mark for each additional response  <b>accept</b> clear indication of correct response eg use of arrows												
			<div><div>C</div><div></div><div></div></div>														
			<div><div>A</div><div></div><div></div></div>														
	b		<table><tr><td></td><td>true</td><td>false</td></tr><tr><td>The bell was used ...</td><td></td><td>✓</td></tr><tr><td>The conditioned reflex ...</td><td></td><td>✓</td></tr><tr><td>The dog learned ...</td><td>✓</td><td></td></tr></table>		true	false	The bell was used ...		✓	The conditioned reflex ...		✓	The dog learned ...	✓		2	three rows correct = 2 marks two rows correct = 1 mark one or zero rows correct = 0 marks  <b>accept</b> a clear indication of correct response eg shaded, circled, crosses (if no ticks)
	true	false															
The bell was used ...		✓															
The conditioned reflex ...		✓															
The dog learned ...	✓																
			Total	[4]													

**OCR (Oxford Cambridge and RSA Examinations)**  
**1 Hills Road**  
**Cambridge**  
**CB1 2EU**

**OCR Customer Contact Centre**

**14 – 19 Qualifications (General)**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://www.ocr.org.uk)**

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

# Archives & Heritage

Oxford Cambridge and RSA Examinations  
is a Company Limited by Guarantee  
Registered in England  
Registered Office; 1 Hills Road, Cambridge, CB1 2EU  
Registered Company Number: 3484466  
OCR is an exempt Charity



**OCR (Oxford Cambridge and RSA Examinations)**  
**Head office**  
Telephone: 01223 552552  
Facsimile: 01223 552553

© OCR 2010

**Biology A**

General Certificate of Secondary Education **A223/01**

Unit 3: Ideas in Context plus B7 (Foundation Tier)

**Mark Scheme for June 2010**

---

Archives &  
Heritage



OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

© OCR 2010

Any enquiries about publications should be addressed to:

OCR Publications  
PO Box 5050  
Annesley  
NOTTINGHAM  
NG15 0DL

Telephone: 0870 770 6622  
Facsimile: 01223 552610  
E-mail: [publications@ocr.org.uk](mailto:publications@ocr.org.uk)



## Guidance for Examiners

Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, e.g. mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

/	= alternative and acceptable answers for the same marking point
(1)	= separates marking points
<b>not/reject</b>	= answers which are not worthy of credit
<b>ignore</b>	= statements which are irrelevant - applies to neutral answers
<b>allow/accept</b>	= answers that can be accepted
(words)	= words which are not essential to gain credit
<u>words</u>	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW/owtte	= alternative wording
ORA	= or reverse argument

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)

work done = 0 marks

work done lifting = 1 mark

change in potential energy = 0 marks

gravitational potential energy = 1 mark

5. Annotations:  
The following annotations are available on SCORIS.

✓	= correct response
✗	= incorrect response
bod	= benefit of the doubt
nbod	= benefit of the doubt <b>not</b> given
ECF	= error carried forward
^	= information omitted
I	= ignore
R	= reject

6. If a candidate alters his/her response, examiners should accept the alteration.
7. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

E.g.

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in  
the two correct  
boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be  
worth 0 marks.

Put ticks (✓) in  
the two correct  
boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be  
worth one mark.

Put ticks (✓) in  
the two correct  
boxes.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be  
worth one mark.

8. The list principle:

If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, e.g. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

9. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

E.g. If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question		Expected Answers	Marks	Additional Guidance
1	a	<b>any two from:</b> no where to lay eggs/less breeding sites; no food / less food / more competition; exposure to predators / predators can see them; idea of migration;	[2]	<b>ignore</b> no where to live/no home
	b	56 (1)	[1]	<b>accept</b> 56 out of 124 or 56/124 <b>reject</b> 45 %
	c	<b>action</b> stop using (long) fishing lines (1) <b>soon</b> because population is being reduced (by 100 000 a year) / leading to extinction; low reproductive rate / lay only a small number of eggs / slow to mature / long time for population to recover (1)	[2]	
	d	<b>any two from:</b> cannot count all/enough of the birds; difficult to count because birds spread over wide area / birds keep moving; by the time all the birds had been counted some would have died / been born;	[2]	<b>ignore</b> references to migration
	e	ban use of/stop using diclofenac (1) remove the excess carcasses (as soon as the cattle dies) (1)	[2]	
	f	idea of world wide / gone forever / all dead (1)	[1]	
	g i	<b>any two from:</b> idea of fewer organisms; idea of fewer species / less variety; in a (specific) place eg ecosystem, habitat, world, Earth, planet, environment;  QWC (1)	[3]	<b>ignore</b> extinction  QWC answer is clear on first reading even if incorrect.

Question			Expected Answers	Marks	Additional Guidance
1	g	ii	idea of ecosystem more stable / effect on other species / keep food chains or webs going / maintains a potential resource for humans (1)	[1]	<b>ignore</b> reference to gene pool <b>ignore</b> extinction
	h		£5000 m (1)	[1]	<b>accept</b> 500 x 10 or £5 000 million or 5 000 000 000
			<b>Total</b>	<b>[15]</b>	
2	a		autotroph – rose / lettuce heterotroph – greenfly/ladybird/owl/shrew/ caterpillar/robin	[1]	both required for mark
	b		autotrophs – make own food (1) heterotrophs – do not make own food / eat food (1)	[2]	<b>ignore</b> references to making energy
	c	i	sun (1)	[1]	
		ii	food / eating / feeding;	[1]	<b>accept</b> consume for eat
		iii	<b>any two from:</b> heat; movement; sound; respiration; excretion/urine; egestion/defecating/faeces; uneaten parts;	[2]	<b>accept</b> examples of movement eg flying  <b>ignore</b> waste
			<b>Total</b>	<b>[7]</b>	

Question		Expected Answers	Marks	Additional Guidance
3	a	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px 5px;">B</div> <div style="border: 1px solid black; padding: 2px 5px;">C</div> <div style="border: 1px solid black; padding: 2px 5px;">A</div> </div>	[2]	<b>B</b> in first box (1) <b>C</b> before <b>A</b> (1)
	b	storage / converted into starch (1) respiration / energy (1) converted into other chemicals / growth / repair / making seeds (1)	[3]	do <b>not</b> accept list of chemical without qualification
	c	<b>any three from:</b>  humus/dead organisms; biomass / living things; inorganic materials / clay/ sand / rocks / minerals or named minerals; air; water;	[2]	3 correct = 2 marks 2 or 1 correct = 1 mark <b>ignore</b> examples of dead things eg worm <b>ignore</b> examples of living things eg worm  ignore reference to fertilisers ignore names gases
		<b>Total</b>	[7]	

4	a	temperature; carbon dioxide; light;	[2]	<b>accept</b> in any order <b>ignore</b> heat / water / minerals  3 correct = 2 marks 2 correct = 1 mark 1 correct = 0 marks
	b	<b>any three from:</b> errors in counting; do not know the volume of the bubbles/gases in bubble / bubbles different sizes; some of the oxygen is used by respiration; some bubbles will stick to the pond weed / not float to top; 1 minute not long enough;	[3]	<b>ignore</b> 'human error' on its own  <b>ignore</b> mention changing variable such as temperature as it is only for 1 minute
		<b>Total</b>	[5]	

Question		Expected Answers	Marks	Additional Guidance
5	a	parasite benefits / feeds on other organism (1) host is harmed (1)	[2]	ignore 'lives off' unless qualified <b>accept</b> disease as harm
	b	correct example (1) feature 1 (1) feature 2 (1)	[3]	features described must be appropriate to parasitic life style
	c	disease/illness/infection/death / less food production (1)	[1]	<b>accept</b> correct named illness eg malaria
		<b>Total</b>	[6]	
6		<b>one mark for each set of words used correctly:</b> idea that DNA is the cause of the problem / makes someone the carrier of the disease / faulty gene (1)  DNA/gene <b>taken from</b> white blood cells (1)  gene probe attaches to (mutated) gene / DNA (1)  use of autoradiography to locate gene probe (1)	[4]	  <b>ignore</b> reference to cheek cells   <b>ignore</b> reference to UV and fluorescence
		<b>Total</b>	[4]	
7	a	carbon dioxide (1) water (1)	[2]	<b>accept</b> either way round
	b i	<b>any two from:</b> to supply/use more energy/ATP; by respiration; to avoid anaerobic respiration / lactic acid build up; to contract faster / longer / idea of muscles working harder;	[2]	
	ii	breathing rate increase (1) heart beat increases (1)	[2]	<b>accept</b> heavier/deeper breathing
		<b>Total</b>	[6]	

Question			Expected Answers	Marks	Additional Guidance																									
8	a		<div><div>B</div><div>A</div></div> <div><div>}</div><div>= (1)</div></div> <div><div>antigens</div><div>antibodies</div></div> <div><div>}</div><div>= (1)</div></div>	[2]																										
	b	i	<div><div>donor</div><table><tr><td></td><td>A</td><td>B</td><td>AB</td><td>O</td></tr><tr><td>A</td><td>✓</td><td>x</td><td>x</td><td>✓</td></tr><tr><td>B</td><td>x</td><td>✓</td><td>x</td><td>✓</td></tr><tr><td>AB</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr><tr><td>O</td><td>x</td><td>x</td><td>x</td><td>✓</td></tr></table><div>recipient</div></div>		A	B	AB	O	A	✓	x	x	✓	B	x	✓	x	✓	AB	✓	✓	✓	✓	O	x	x	x	✓	[2]	4 correct = 2 marks 2 or 3 correct = 1 mark 1 correct = 0
	A	B	AB	O																										
A	✓	x	x	✓																										
B	x	✓	x	✓																										
AB	✓	✓	✓	✓																										
O	x	x	x	✓																										
		ii	O (1)	[1]																										
			Total	[5]																										

**OCR (Oxford Cambridge and RSA Examinations)**  
**1 Hills Road**  
**Cambridge**  
**CB1 2EU**

**OCR Customer Contact Centre**

**14 – 19 Qualifications (General)**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://www.ocr.org.uk)**

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Archives &  
Heritage

Oxford Cambridge and RSA Examinations  
is a Company Limited by Guarantee  
Registered in England  
Registered Office; 1 Hills Road, Cambridge, CB1 2EU  
Registered Company Number: 3484466  
OCR is an exempt Charity



OCR (Oxford Cambridge and RSA Examinations)  
Head office  
Telephone: 01223 552552  
Facsimile: 01223 552553

© OCR 2010



**Biology A**

General Certificate of Secondary Education **A223/02**

Unit 3: Ideas in Context plus B7 (Higher Tier)

**Mark Scheme for June 2010**

---

Archives &  
Heritage

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

© OCR 2010

Any enquiries about publications should be addressed to:

OCR Publications  
PO Box 5050  
Annesley  
NOTTINGHAM  
NG15 0DL

Telephone: 0870 770 6622  
Facsimile: 01223 552610  
E-mail: [publications@ocr.org.uk](mailto:publications@ocr.org.uk)

## Guidance for Examiners

Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, e.g. mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

/	= alternative and acceptable answers for the same marking point
(1)	= separates marking points
<b>not/reject</b>	= answers which are not worthy of credit
<b>ignore</b>	= statements which are irrelevant - applies to neutral answers
<b>allow/accept</b>	= answers that can be accepted
(words)	= words which are not essential to gain credit
<u>words</u>	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW/owtte	= alternative wording
ORA	= or reverse argument

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)

work done = 0 marks

work done lifting = 1 mark

change in potential energy = 0 marks

gravitational potential energy = 1 mark

5. Annotations:  
The following annotations are available on SCORIS.

✓	= correct response
✗	= incorrect response
bod	= benefit of the doubt
nbod	= benefit of the doubt <b>not</b> given
ECF	= error carried forward
^	= information omitted
I	= ignore
R	= reject

6. If a candidate alters his/her response, examiners should accept the alteration.
7. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

E.g.

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in  
the two correct  
boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be  
worth 0 marks.

Put ticks (✓) in  
the two correct  
boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be  
worth one mark.

Put ticks (✓) in  
the two correct  
boxes.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be  
worth one mark.

8. The list principle:

If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, e.g. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

9. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

E.g. If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question			Expected Answers	Marks	Additional Guidance
1	a	i	<b>any two from:</b> idea of fewer organisms; idea of fewer species / less variety; in a (specific) place eg ecosystem, habitat, world, Earth, planet, environment;  QWC (1)	[3]	ignore extinction  QWC answer is clear on first reading even if incorrect.
		ii	idea of ecosystem more stable / effect on other species / keep food chains or webs going / maintains a potential resource for humans (1)	[1]	ignore reference to gene pool ignore extinction
	b		idea of world wide / gone forever / all dead (1)	[1]	
	c		<b>any two from:</b> test dead vultures (for diclofenac); test live vultures (for diclofenac); then compare effect of different amounts / (work out) lethal amount;	[2]	test vultures for diclofenac = 1 mark ignore any reference to other drugs ignore ban diclofenac to see if numbers of deaths decreases ignore any reference to experiments on vultures as species is on verge of extinction and would not be allowed
	d		idea that numbers are only over a 26 year period / does not say when data collected / no dates specified / there is no graph (1)	[1]	ignore any reference to 2008 study
	e		idea that it may not be reliable / atypical results / idea of not enough data / need replication (1)	[1]	ignore accuracy
	f		they might be dying / problems caused in their winter (feeding) sites (1)  they might be dying / problems caused on their migration routes (1)	[2]	ignore gone to different site allow the cause may not be in their summer nesting sites for 1 mark warning migration must refer to numbers falling not just moving from one site to another
	g		<b>any two from:</b> vultures smaller (body mass) / ORA; idea that vultures eat meat from <u>lots of/many</u> cows/cattle; idea that poison accumulates in vultures / concentrated;	[2]	ignore vultures eat cattle or cows containing diclofenac because the plural is not specific enough
			<b>Total</b>	<b>[13]</b>	

Question		Expected Answers	Marks	Additional Guidance
2		transferred into glucose/sugar/starch/ photosynthesis (1)	[2]	<b>accept</b> word or symbol equation for 1 mark
		one example of what chemical energy is used for eg respiration / cellulose / protein (1)		<b>ignore</b> make food / growth / repair / energy alone
		<b>Total</b>	<b>[2]</b>	
3	a	correct food chain (1) four or five trophic levels drawn (1) each step getting smaller from bottom to top (1) correct label of organism (1)	[4]	food chain must have arrows pointing in the right direction.  <b>examples of food chains are:</b> lettuce --> caterpillar --> shrew --> owl lettuce --> caterpillar --> robin --> owl rose --> caterpillar --> shrew --> owl rose --> caterpillar --> robin --> owl rose --> greenfly --> ladybird --> robin --> owl  <b>ignore</b> producer / primary / secondary consumer
	b	idea that energy is transferred / shows energy at each level (1) takes into account the mass / size of an organism (1)	[2]	<b>accept</b> idea of ignoring numbers of organisms in pyramid of biomass. <b>ignore</b> references to the shape of the pyramid
		<b>Total</b>	<b>[6]</b>	

Question		Expected Answers	Marks	Additional Guidance
4	a	starch is not soluble / glucose is soluble (1)  so will stay where put (inside cells) / no osmotic effect (1)	[2]	<b>ignore</b> will not be lost
	b	i 12 noon / noon / mid day / 12pm (1)	[1]	<b>ignore</b> 12 <b>reject</b> 12am
		ii $\left. \begin{matrix} 7.30 \\ 4.30 \end{matrix} \right\} = (1)$ $\left. \begin{matrix} \text{am} \\ \text{pm} \end{matrix} \right\} = (1)$	[2]	7.30 and 16.30 = 2 marks  <b>accept</b> morning and afternoon
		iii idea that photosynthesis is greater than respiration / cannot photosynthesise at night / ORA (1)  idea of to make food or glucose or starch / have <b>more</b> energy (1)	[2]	do not credit reference to X and Y, only to respiration and photosynthesis <b>ignore</b> references to CO <sub>2</sub> and oxygen  <b>do not penalise</b> references to making / creating energy
		<b>Total</b>	[7]	

5	a	temperature; carbon dioxide; light;	[2]	<b>accept</b> in any order <b>ignore</b> heat / water / minerals  3 correct = 2 marks 2 correct = 1 mark 1 correct = 0 marks
	b	<b>any three from:</b> errors in counting; do not know the volume of the bubbles/gases in bubble / bubbles different sizes; some of the oxygen is used by respiration; some bubbles will stick to the pond weed / not float to top; 1 minute not long enough;	[3]	<b>ignore</b> 'human error' on its own  <b>ignore</b> mention changing variable such as temperature as it is only for 1 minute
		<b>Total</b>	[5]	

Question		Expected Answers	Marks	Additional Guidance
6	a	<b>any two from:</b> mutated / faulty allele / changed gene or DNA; is co-dominant / recessive; alters haemoglobin / shape of Red Blood Cell; idea of less oxygen;	[2]	
	b	idea that it protects against malaria (1)  idea that people with sickle cell are more likely to survive (than non carriers) / ORA (1)  and reproduce / pass (gene / sickle cell anaemia) on to next generation / ORA (1)	[3]	ignore reference to natural selection
		<b>Total</b>	[5]	
7		<b>one mark for each set of words used correctly:</b> idea that DNA is the cause of the problem / makes someone the carrier of the disease / faulty gene (1)  DNA/gene <b>taken from</b> white blood cells (1)  gene probe attaches to (mutated) gene / DNA (1)  use of autoradiography to locate gene probe (1)	[4]	ignore reference to cheek cells   ignore reference to UV and fluorescence
		<b>Total</b>	[4]	



Question		Expected Answers	Marks	Additional Guidance
8	a	(used) to make ATP (1)	[1]	<b>accept</b> released as heat
	b	muscle contracts / shorter / fatter (1)	[1]	<b>reject</b> relax
	c	<b>any two from:</b> different levels of fitness/physical condition/ exercise; do different sports; idea of different genetic makeup/age/gender;	[2]	<b>ignore</b> environmental factors such as life style / size and weight
	d	glucose only on left (1) lactic acid only on right (1)	[2]	<b>ignore</b> 'energy'
		<b>Total</b>	<b>[6]</b>	

9	a	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> B A </div> <div style="font-size: 3em;">}</div> <div style="text-align: center;"> = (1) </div> <div style="text-align: center;"> antigens antibodies </div> <div style="font-size: 3em;">}</div> <div style="text-align: center;"> = (1) </div> </div>	[2]																															
	b	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">recipient</div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td><th colspan="4">donor</th></tr> <tr> <td></td><th>A</th><th>B</th><th>AB</th><th>O</th></tr> <tr> <th>A</th><td>✓</td><td>x</td><td>x</td><td>✓</td></tr> <tr> <th>B</th><td>x</td><td>✓</td><td>x</td><td>✓</td></tr> <tr> <th>AB</th><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr> <tr> <th>O</th><td>x</td><td>x</td><td>x</td><td>✓</td></tr> </table> </div>		donor					A	B	AB	O	A	✓	x	x	✓	B	x	✓	x	✓	AB	✓	✓	✓	✓	O	x	x	x	✓	[3]	O column correct = 1 mark AB row correct = 1 mark rest are all 'x's = 1 mark
	donor																																	
	A	B	AB	O																														
A	✓	x	x	✓																														
B	x	✓	x	✓																														
AB	✓	✓	✓	✓																														
O	x	x	x	✓																														
	c	blood will clot (1) idea of blocking blood vessels / stop blood flow / stroke (1)	[2]	<b>ignore</b> heart attack																														
		<b>Total</b>	<b>[7]</b>																															

**OCR (Oxford Cambridge and RSA Examinations)**  
**1 Hills Road**  
**Cambridge**  
**CB1 2EU**

**OCR Customer Contact Centre**

**14 – 19 Qualifications (General)**

Telephone: 01223 553998

Facsimile: 01223 552627

Email: [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://www.ocr.org.uk)**

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

# Archives & Heritage



Oxford Cambridge and RSA Examinations  
is a Company Limited by Guarantee  
Registered in England  
Registered Office; 1 Hills Road, Cambridge, CB1 2EU  
Registered Company Number: 3484466  
OCR is an exempt Charity



**OCR (Oxford Cambridge and RSA Examinations)**  
**Head office**  
Telephone: 01223 552552  
Facsimile: 01223 552553

© OCR 2010