

**Biology A**

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

Unit 1: Modules B1, B2, B3

**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)

## 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
  - not/reject** = answers which are not worthy of credit
  - ignore** = statements which are irrelevant - applies to neutral answers
  - allow/accept** = answers that can be accepted
  - (words) = words which are not essential to gain credit
  - words = 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 **not** 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

<b>Edinburgh</b>	<input type="checkbox"/>
<b>Manchester</b>	<input type="checkbox"/>
<b>Paris</b>	<input type="checkbox"/>
<b>Southampton</b>	<input type="checkbox"/>

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).

<b>Edinburgh</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Manchester</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Paris</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Southampton</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Score:</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NR</b>

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	<p>both from her mother <input type="checkbox"/></p> <p>both from her father <input type="checkbox"/></p> <p>neither ... <input type="checkbox"/></p> <p>one from ... .. and one from ... <input checked="" type="checkbox"/> (1)</p>	[1]	if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc
	c	<p>... one dominant allele. <input type="checkbox"/></p> <p>... two dominant alleles. <input type="checkbox"/></p> <p>... one recessive allele. <input type="checkbox"/></p> <p>... two recessive alleles. <input checked="" type="checkbox"/> (1)</p> <p>... one ... .. and one ... <input type="checkbox"/></p>	[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]	3 correct responses = 2 marks 2 or 1 correct responses = 1 mark if no ticks, allow any other indication of correct response eg underlining, cross, shaded, smiley face etc

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>                      saliva – enzymes/chemicals;                      sweat - acidic / chemicals;                      tears - enzymes / chemicals;  <u>stomach</u> – acid;                      mucous/wax – traps microorganisms;</p>	[3]	name of barrier <b>must</b> be linked to correct method of operating  <b>allow</b> ‘clots and scabs covering wounds’ <b>ignore</b> non-biological names <b>ignore</b> gut
		<b>Total</b>	<b>[8]</b>	



Question		Expected Answers	Marks	Additional Guidance								
5	a	smoke cigarettes <input type="checkbox"/> exercise regularly <input checked="" type="checkbox"/> (1) drink a lot of alcohol <input type="checkbox"/> have a poor diet <input type="checkbox"/> reduce his stress level <input checked="" type="checkbox"/> (1)	[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 border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>high risk</th> <th>low risk</th> </tr> </thead> <tbody> <tr> <td>C</td> <td>A</td> </tr> <tr> <td></td> <td>B</td> </tr> <tr> <td></td> <td>D</td> </tr> </tbody> </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											
<b>Total</b>			[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]	three correct lines = 2 marks two correct lines = 1 mark one correct line only = 0 marks  more than three lines – deduct 1 mark for each additional line
		<b>Total</b>	<b>[2]</b>	

Question		Expected Answers	Marks	Additional Guidance
8	a	... Dead Sea Scrolls <input type="checkbox"/> stories ... <input type="checkbox"/> the fossil record <input checked="" type="checkbox"/> (1) ... on other planets <input type="checkbox"/> ... in DNA <input checked="" type="checkbox"/> (1) ... internet ... <input type="checkbox"/>	[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	All ... .. common ancestor. <input checked="" type="checkbox"/> (1) Only one ... .. common ancestor. <input type="checkbox"/> <i>Australopithecus</i> ... <input type="checkbox"/> None ... .. common ancestor. <input type="checkbox"/> <i>Homo erectus</i> ... <input type="checkbox"/>	[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>            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 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>            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

**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