

## **Mark Scheme for June 2012**

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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.

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**Annotations**

Used in the detailed Mark Scheme:

<b>Annotation</b>	<b>Meaning</b>
/	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	credit alternative wording / or words to that effect
ORA	or reverse argument

Available in scoris to annotate scripts:

	indicate uncertainty or ambiguity
	benefit of doubt
	contradiction
	incorrect response
	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	no benefit of doubt
	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

**Subject-specific Marking Instructions**

- a. Accept any clear, unambiguous response (including mis-spellings of scientific terms if they are *phonetically* correct, but always check the guidance column for exclusions).
- b. 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 the third and fourth boxes are required for the mark:*

<del>✗</del>
<del>✗</del>

*This would be worth  
1 mark.*

✓
<del>✗</del>

*This would be worth  
0 marks.*

<del>✗</del>
<del>✗</del>
✓
✓

*This would be worth  
1 mark.*

- c. 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.

d. Marking method for tick-box questions:

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 and other markings. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses. Credit should be given according to the instructions given in the guidance column for the question. 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 cities in England:

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		✓		✓	✓		✓	
<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>

e. For answers marked by levels of response:

- i. **Read through the whole answer from start to finish**
- ii. **Decide the level that best fits** the answer – match the quality of the answer to the closest level descriptor
- iii. **To determine the mark within the level**, consider the following:

Descriptor	Award mark
A good match to the level descriptor	The higher mark in the level
Just matches the level descriptor	The lower mark in the level

- iv. Use the **L1**, **L2**, **L3** annotations in Scoris to show your decision; do not use ticks.

Quality of Written Communication skills assessed in 6-mark extended writing questions include:

- appropriate use of correct scientific terms
- spelling, punctuation and grammar
- developing a structured, persuasive argument
- selecting and using evidence to support an argument
- considering different sides of a debate in a balanced way
- logical sequencing.

Question		Answer	Marks	Guidance
1	(a)	organisms / species (1) that are not native / foreign (1)	2	
	(b)	get less (1)	1	
	(c) (i)	south east / bottom right (1)	1	<b>accept</b> any correctly named location
	(ii)	they are spreading / more sightings/reports/ increased numbers (1)	1	
	(d)	insect only eats knotweed/does not eat any other plants (1)	1	<b>ignore</b> references to trials
	(e) (i)	(75% of 600 =) 450 (1) (600 + 450 =) 1050 (1)	2	1050 = 2 marks <b>ecf</b>
	(ii)	no increase (on 600 / previous value) (1)	1	<b>do not accept</b> increase in range
	(iii)	<i>any two from:</i> idea of damage they may do to food web / ecosystem / biodiversity (1) damaged explained or qualified e.g. may be a predator (1) interbreed (1) introduce disease / affect (human) health (1)	2	<b>ignore</b> ideas about monitoring  <b>accept</b> named example
	(f)	<i>any three from:</i>  aggressive courting behaviour /mate/interbreed/(with native animals); (1) more aggressive than native animals/replace native animals; (1) carry viruses; (1) grow out of control; (1)	3	any order
<b>Total</b>			<b>14</b>	



Question		Answer	Marks	Guidance
2	(a)	water on LHS (1) glucose <b>and</b> oxygen on RHS	2	glucose and oxygen either way round <b>accept</b> correct formulae
	(b)	C before E (1) E before B (1)	2	
	(c)	(i) idea or example of burning more fossil fuels (1) or deforestation (1)	1	
		(ii) increases (1) because carbon dioxide is a limiting factor (1)	2	
	(d)	(i) starch / cellulose (1)	1	
		(ii) proteins/enzymes (1)	1	
		<b>Total</b>	<b>9</b>	

Question		Answer	Marks	Guidance	
3	(a)	...one eats only meat and the other eats only plants.	1		
		...both organisms benefit from each other.			
		...one benefits and the other is harmed.			✓
		...both organisms are harmed.			
		...both organisms eat only meat.			
	(b)	feature correct for named parasite (1) feature explained how it works (1)	2		
	(c)	as host evolves defensive mechanism (1) parasite evolves an attack mechanism to compensate (1)  OR as parasite evolves an attack mechanism (1) host evolves a defensive mechanism to compensate (1)	2	<b>one mark</b> for idea that when one evolves/changes/adapt the other must also evolve to survive	
<b>Total</b>			<b>5</b>		

Question		Answer	Marks	Guidance																		
4	(a)	<p><i>any three from:</i></p> <p><b>Isolation i.e.</b> gene cut or extracted from DNA of daffodil OR enzyme used to cut (1)</p> <p><b>Replication</b> replication of gene (1)</p> <p><b>Vector named</b> eg virus / plasmid / bacteria / gold bullet idea (1)</p> <p><b>Explanation of transfer e.g.</b> gene enters <b>rice</b> cells / nucleus / chromosome / DNA (1)</p>	3																			
	(b)	(i) Anita (1)	1																			
		(ii) Jane (1)	1																			
		(iii) Peter (1)	1																			
	(c)	<table border="1"> <tbody> <tr> <td>discovering a new antibiotic</td> <td></td> <td></td> </tr> <tr> <td>having identical twins</td> <td></td> <td></td> </tr> <tr> <td>becoming a blood donor</td> <td></td> <td></td> </tr> <tr> <td>using bacteria to make the hormone insulin</td> <td></td> <td>✓</td> </tr> <tr> <td>taking cuttings from plants</td> <td></td> <td></td> </tr> <tr> <td>making crop plants disease resistant</td> <td></td> <td>✓</td> </tr> </tbody> </table>	discovering a new antibiotic			having identical twins			becoming a blood donor			using bacteria to make the hormone insulin		✓	taking cuttings from plants			making crop plants disease resistant		✓	2	
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<b>Total</b>			<b>8</b>																			

Question		Answer	Marks	Guidance
5	(a)	respiration energy oxygen / glucose glucose / oxygen heart	3	5 correct = 3 marks 4 correct = 2 marks 3 or 2 correct = 1 mark  oxygen and glucose can be in either order
	(b)	glucose LHS (1) lactic acid RHS (1)	2	<b>accept</b> lactate
		<b>Total</b>	<b>5</b>	

Question		Answer	Marks	Guidance
6	(a)	idea that blood goes through <u>heart</u> twice for each circulation (1)	1	<b>incorrect</b> context of the word "heart" does not score
	(b)	(i) a valve (1) prevent blood flowing backwards (1)	2	<b>ignore</b> name of valve
		(ii) <u>veins</u> (1)	1	veins and arteries is incorrect
	(c)	oxygen passes out of blood into tissue fluid (1) oxygen passes from tissue fluid into cells (1) diffuses (1) QWC (1)	4	QWC = makes sense and includes some correct biology
<b>Total</b>			<b>8</b>	

Question		Answer	Marks	Guidance
7	(a)	label going to dotted area (1)	1	
	(b)	any 2 reasonable answers:  related to James's medical history/current state of health/family history specific to gout or joint problems (1)  related to lifestyle (1)	2	<b>ignore</b> general questions relating to family illness
	(c)	to help diagnosis/to identify cause (1) decide correct treatment/lifestyle change (1)	2	
	(d)	idea of any benefit e.g. doctor will know his <b>medical</b> history/can monitor progress (1)	1	<b>ignore</b> trust
		<b>Total</b>	<b>6</b>	
		<b>Paper Total</b>	<b>55</b>	

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