

# **Environmental and Land-Based Science**

General Certificate of Secondary Education

Unit **B493/03**: Management of the Natural Environment (Foundation Tier)

## **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.

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

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## Annotations

Used in the detailed Mark Scheme:

Annotation	Meaning
/	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

Available in scoris to annotate scripts

Annotation	Meaning
	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

Annotation	Meaning
	no benefit of doubt
	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

Question		CBT	Answer	Mark	Guidance															
1		1	<b>D</b> visual	1																
2		2	<b>A</b> burning rubbish on a bonfire	1																
3		3	<b>D</b> work can be done more quickly	1																
4		4	<p><b>one of:</b></p> <table border="0" style="margin-left: 40px;"> <tr> <td style="text-align: center;"><b>predator</b></td> <td></td> <td style="text-align: center;"><b>prey</b></td> </tr> <tr> <td style="text-align: center;">fox</td> <td style="text-align: center;"> </td> <td style="text-align: center;">fox</td> </tr> <tr> <td style="text-align: center;">grasshopper</td> <td style="text-align: center;"> </td> <td style="text-align: center;">grasshopper</td> </tr> <tr> <td style="text-align: center;">partridge</td> <td style="text-align: center;"> </td> <td style="text-align: center;">partridge</td> </tr> <tr> <td style="text-align: center;">slug</td> <td style="text-align: center;"> </td> <td style="text-align: center;">slug</td> </tr> </table>	<b>predator</b>		<b>prey</b>	fox		fox	grasshopper		grasshopper	partridge		partridge	slug		slug	2	<p>one mark for predator</p> <p>prey must be correctly linked to predator for second mark</p>
<b>predator</b>		<b>prey</b>																		
fox		fox																		
grasshopper		grasshopper																		
partridge		partridge																		
slug		slug																		
5		5	<b>B</b> people are using more electrical equipment	1																
6	(a)	6	year 2	1																
	(b)	7	<b>A</b> to adds nutrients	1																

Question		CBT	Answer	Mark	Guidance
7		8	<p>The diagram shows three boxes on the left: 'fertiliser', 'herbicide', and 'pesticide'. Lines connect 'fertiliser' to the top two text boxes, 'herbicide' to the middle two text boxes, and 'pesticide' to the bottom text box.</p> <ul style="list-style-type: none"> <li>builds up in food chains, so damaging predators</li> <li>causes excessive plant growth in streams and rivers, so reducing light levels</li> <li>kills some plants needed by animals, so reducing biodiversity</li> <li>prevents sunlight reaching leaves, so reducing photosynthesis</li> </ul>	2	<p>all three correct for two marks</p> <p>one or two correct for one mark</p>
8		9	<p><b>any two of:</b></p> <ul style="list-style-type: none"> <li>greater yield</li> <li>easier to feed the animals</li> <li>easier to observe / monitor animals health</li> <li>less labour needed</li> <li>more profit for farmers</li> <li>safe from predators</li> <li>the food is cheaper in the shops</li> <li>able to control environment</li> <li>animal welfare</li> </ul>	2	<p><b>reject:</b> ref to cost / expensive; more chickens can be farmed; less pollution</p> <p><b>accept:</b> higher yield (more eggs); grow faster; saves time</p>

Question		CBT	Answer	Mark	Guidance
9		10	<b>any two of:</b> eyes face forwards; good eyesight; able to see in low light; sharp beak; sharp claws	2	<b>accept</b> good hearing / camouflage / silent flight <b>reject</b> rotate neck 360 degrees
10	(a)	11	variety of crops grown in the same field / different crops grown in subsequent years / rotation	1	<b>accept</b> other valid answers <b>accept</b> Grow different plants
	(b)	11	different crops use different nutrients / less fertiliser required / less build up of pests / disease / using different depths of soil	1	<b>reject</b> general non specific answers <b>reject</b> ORA <b>accept</b> Increases biodiversity
11		12	<b>any two of:</b> do it when there is no wind; on a wet day; incorporate organic matter; plant wind brakes	2	<b>accept</b> use zero ploughing; use direct drilling; autumn wheat rather than spring; use of cover crops; go slower
12		13	quicker to do; can be selective; persistent; can be pre-emergent; OWTTE  comments on answer: hoeing can be selective	2	<b>reject</b> cost unless qualified in terms of time; easier; more effective; works quicker  <b>accept</b> less labour
13	(a)	14	to ensure all water has been lost OWTTE	1	<b>not</b> it gives an inaccurate result / because mass changes / fair test
	(b)	14	mass at step 2 minus mass at step 5 / mass of soil minus mass of dried soil	1	award a mark if calculation of percentage given
14	(a)	15	woodlice	1	
	(b)	16	earthworms and slugs	1	any order
15	(a)	17	29 584 km [506 584 – 477 000]	1	
	(b)	17	<b>B</b> 5.8%	1	

Question		CBT	Answer	Mark	Guidance
16	(a)	18	5.5	1	
	(b)	19	sandy loam, arable, pH6	1	all three parts needed – any order
17		20	lifting heavy objects; dropping heavy objects; carrying long objects / sharp objects / fragile objects / tripping	3	<b>allow</b> precautions eg lift correctly / wear steel capped boots <b>accept</b> don't carry too much / slip if qualified <b>reject</b> ref to water / electricity
18		21	water: tides; waves; hydroelectric dams: idea of storing water to turn turbine wind: turning turbine crops: direct burning to make steam / in a power station; fermentation; bio fuels generator to convert turning turbine into electricity	2	no marks for choosing the method  1 method of turning turbine  1 link to generating electricity
19	(a)	22	oxygen concentration; temperature; pH; conductivity / mineral concentration / nutrients; light intensity; turbidity	1	1 mark for identifying <b>two</b> environmental conditions that could be monitored <b>reject</b> pollution / depth / water level
	(b)	22	<b>probe</b> (monitor) connected to <b>data logger</b> . download information to <b>computer</b> for analysis	2	1 mark for monitor to data logger  1 mark for computer for analysis <b>reject</b> ref to data base
<b>Paper Total</b>				<b>36</b>	



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