

Applied Science (Double Award)

General Certificate of Secondary Education

Unit **B482/01** Science for the needs of Society

Mark Scheme for January 2013

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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

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
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

Subject-specific Marking Instructions

- a. If a candidate alters his/her response, examiners should accept the alteration.
- 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.

Eg

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

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, eg 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 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, eg 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.

Eg 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		Answer	Marks	Guidance
1	(a)	to save money/stop wasting money/reduce cost/it is expensive/environmental consideration of burning fossil fuel, eg climate change/global warming/reduce carbon dioxide/reduce carbon footprint/saves fossil fuels.	1	ignore 'harms environment' or 'pollution' alone allow any environmental outcome of burning fossil fuels
	(b)	windows	1	
	(c)	(i) medium cost /AW (1) highest energy loss / 30% energy loss (1) next shortest payback term (2)	2	allow 'heat' for 'energy'
		(ii) cavity wall insulation	1	box 2
	(d)	shows numbers, 10, 15, 25, 30; 20%	2	80 shown in working scores first mark 20 scores 2 marks
	(e)	(i) easy to transmit/National Grid/can be used for different devices/heat and light/all over the house idea/clean to use/easy to switch on and off/no storage	1	ignore 'everything uses...' 'lots of things use...', ignore convenient/easy to use/safer/no pollution
		(ii) C	1	
		(iii) turn off lights/use fewer lights;	1	ignore using other types of bulb
Total			10	

Question		Answer	Marks	Guidance
2	(a)	Iron → Fe sulfur → S rock salt → NaCl limestone → CaCO ₃	3	all correct = 3 2/3 correct = 2 1 correct = 1 if a box has more than one line, consider both lines as incorrect.
	(b)	sulfur	1	
	(c)	Iron → making car bodies sulfur → making sulfuric acid rock salt → flavouring food limestone → making cement	3	all correct = 3 2/3 correct = 2 1 correct = 1 if a box has more than one line, consider both lines as incorrect.
	(d) (i)	bulk	1	
	(ii)	developing new fertilisers; controlling the quality of the products;	2	box 1; box 3. if more than 2 boxes ticked, apply list principle.
		Total	10	

Question		Answer	Marks	Guidance
3	(a)	<p>fungicide → kills moulds</p> <p>fertiliser → provides nutrients</p> <p>pesticide → kills insects...</p> <p>herbicide → kills weeds</p>	2	<p>ignore line from fungicide box (given)</p> <p>all 3 correct = 2</p> <p>1/2 correct = 1</p>
	(b)	fertiliser	1	
	(c)	<p>cell wall nucleus</p> <p>chloroplast cytoplasm</p>	3	<p>all correct = 3</p> <p>2/3 correct = 2</p> <p>1 correct = 1</p>
	(d)	<p>cell wall → supports the cell</p> <p>chloroplast → absorbs light...</p> <p>nucleus → contains genetic information</p>	2	<p>all correct = 2</p> <p>1/2 correct = 1</p>
	(e)	<p>only animal manure is used as a fertiliser</p> <p>most weeds are dug up by hand.</p>	2	
Total			10	

Question			Answer	Marks	Guidance
4	(a)	(i)	polymer	1	
		(ii)	F T T F	3	all 4 correct = 3 3 correct = 2 1/2 correct = 1
		(iii)	any two from don't need to cut it; less maintenance idea / keeps it's colour / does not go brown; more hardwearing / lasts longer; any weather; not damaged when wet/ does not get muddy; better grip;	2	accept 'does not rot' ignore 'it is hard / brittle'
	(b)	(i)	melts / softens	1	accept changes shape
		(ii)	not all polymers melt	1	
	(c)		design new product; make new product; test new product; specific properties to test eg strength, durability; environmental testing/monitoring; safety issues	2	accept 'improvements' idea as AW for 'design' ignore check quality (in the question); ignore references to finding / developing <u>different</u> products. or polymers
Total				10	

Question			Answer	Marks	Guidance
5	(a)	(i)	sugar/glucose	1	
		(ii)	(to test if) the person high blood sugar levels/low blood sugar levels/correct blood sugar levels	1	
		(iii)	any two from idea of automatic/not forget; no more injections; anywhere idea; dose is measured/no errors in measurement; continuous monitoring/immediate treatment;	2	ignore "quicker" alone
	(b)	(i)	pancreas	1	
		(ii)	plasma	1	
		(iii)	insulin is carried in the blood; blood travels more slowly than nerve impulses	2	box 1 box 4
	(c)		more exercise; eat less sugar/control sugar in food/(change your) diet	2	
			Total	10	

Question			Answer	Marks	Guidance
6	(a)	(i)	idea of movement; plates (tectonic);	2	allow 'continental drift' or 'continents move' for first mark allow 'separate' for 'move' allow 'breaks <u>away</u> ' or 'splits <u>away</u> ' but not 'breaks' or 'splits' alone.
		(ii)	mountain/ocean formation;	1	reject short term changes eg earthquakes/volcanoes/erosion/environmental effects ignore land formation/sea level change
	(b)		photosynthesis	1	
	(c)	(i)	respiration/breathing/needed for energy (in the body);	1	
		(ii)	greenhouse effect; keeps planet warm/global warming;	2	accept 'plants photosynthesise' for 1 mark only
	(d)	(i)	the Sun; planets/named planet or planets; moons/asteroids/comet/satellites;	2	reject stars/galaxies/black holes; ignore Earth ignore meteor ignore space apply the list principle
		(ii)	the 'Big Bang'	1	
			Total	10	
			Paper Total	60	

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