

**Additional Science A**

General Certificate of Secondary Education

Unit **A215/01**: Unit 1 – Modules B4, C4, P4

**Mark Scheme for June 2011**

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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
<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

- Accept any clear, unambiguous response (including mis-spellings of scientific terms if they are *phonetically* correct, but always check the guidance column for exclusions).
- If a candidate alters his/her response, examiners should accept the alteration.
- 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:

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

*This would be worth  
1 mark.*

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

*This would be worth  
0 marks.*

<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.*

d. 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.

e. 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	<input type="checkbox"/>
Manchester	<input type="checkbox"/>
Paris	<input type="checkbox"/>
Southampton	<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).

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>

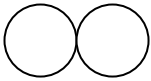
## MARK SCHEME:

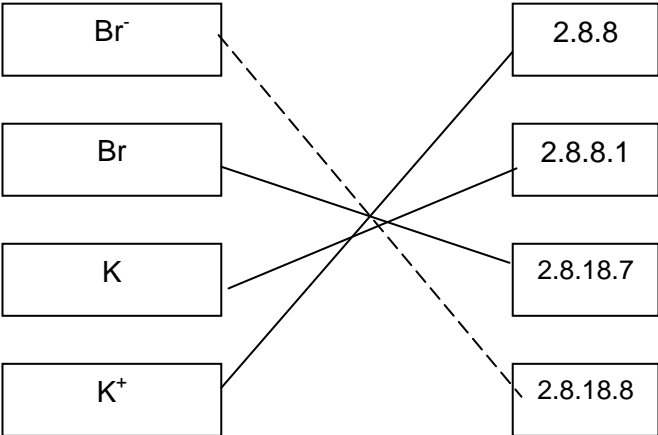
Question		Answer	Mark	Guidance
1	a	<input type="checkbox"/> the same as the energy that he loses <input checked="" type="checkbox"/> (1) <input type="checkbox"/>	1	
	b	<input type="checkbox"/> <input type="checkbox"/> <b>higher than</b> the temperature in his fingers <input checked="" type="checkbox"/> (1)	1	
	c	<b>brain</b> (1)	1	
	d i	<b>34°C</b> (1)	1	
	ii	<b>maximum of two symptoms from:</b> shivering ; confusion/ drowsiness ; slurred speech ; loss of coordination ; weak pulse ; slow or shallow breathing ;  <b>maximum of two treatments from:</b> insulate/ give examples of insulation, e.g. wrap in a blanket /extra clothing/ sleeping bag ; sharing body heat / go somewhere warm ; handle gently (to keep blood flow in limbs low) ; <b>warm</b> gently (with warm towels) ; give <b>warm</b> drinks ;	3	<b>credit</b> two treatments and one symptom <b>OR</b> viseversa  <b>accept</b> can't think can't pay attention / loss of judgment. <b>accept</b> body temperature drops below 35°C  <b>accept</b> reverse argument e.g. <u>do not</u> give <b>hot</b> bath, use <b>hot</b> water to warm them up, rubbing skin to warm them up, give alcoholic drinks  <b>ignore</b> loss of feeling in feet/ hands/ blue lips or fingers <b>ignore</b> vague "keep them warm" statements
<b>Total</b>			<b>[7]</b>	

Question		Answer	Mark	Guidance
2	a	breathing out <u>and</u> sweating (1)	1	both correct for 1 mark
	b	<p><b>chemical</b></p> <p>how much her kidneys reabsorb</p> <p>sugar</p> <p>water</p> <p>salt</p> <p>all of it</p> <p>as much as the body needs</p>	2	3 correct = 2 marks 1 or 2 correct = 1 mark
<b>Total</b>			<b>[3]</b>	

Question		Answer	Mark	Guidance
3	a	<div style="text-align: right;"> <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input checked="" type="checkbox"/> (1) </div> ... proteins that speed up chemical ...	1	
	b	<b>B (1)</b>	1	
	c	<b>decrease denatured shape</b>	2	3 correct = 2 marks 2 correct = 1 mark 1 or 0 correct = 0 marks
<b>Total</b>			<b>[4]</b>	



Question		Answer	Mark	Guidance
4	a	<div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>            iron chloride <input checked="" type="checkbox"/> (1)         </div>	1	
	b	reactivity is different / less (1) Iodine is the cause of the difference (1)	2	linking less glow to less reaction = 1 mark explaining less reaction with property of iodine = 1 mark "iodine is less reactive" = 2 marks <b>accept</b> reverse argument about chlorine
	c	i <b>any two from:</b> sodium is [very] reactive ; reacts with air/ oxygen/ moisture/ Sodium does not react with the oil ;	2	<b>reject</b> dangerous (it is in stem) <b>accept</b> oil stops it <u>reacting</u> . <b>ignore</b> vague references to "keeping it safe", or "safer"
		ii NaCl (1)	1	<b>ignore</b> any equation as long as the product is correct. <b>reject</b> if capitalisations are wrong.
		iii 	1	
<b>Total</b>			<b>[7]</b>	

Questions		Answer		Mark	Guidance
5	a	<b>symbol</b>	<b>electronic structure</b>	2	3 lines correct = 2 marks 2 or 1 lines correct = 1 mark
					

Question		Answer	Mark	Guidance
5	b	<p>... the particles stay as ions. <input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <hr style="border-top: 1px dashed black;"/> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p>... move randomly through the solution <input checked="" type="checkbox"/> (1)</p>	2	
	c	<p>circles all approximately the same size</p> <p>they should be grouped together</p> <p>positive circles may only touch negative, and vice versa</p>	1	<p>There must be at least four circles; any extra circles must be correct</p> <p><b>credit</b> any <u>correct</u> pattern of four circles, including chains</p> <p><b>ignore</b> small gaps between circles</p> <p><b>accept</b> variation in circle size so long as it doesn't look intentional</p>
		<b>Total</b>	<b>[5]</b>	

Question	Answer	Mark	Guidance
6	All the lines for sodium are present. <input checked="" type="checkbox"/> (1) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> ...sodium...one other element are present <input checked="" type="checkbox"/> (1)	2	
<b>Total</b>		<b>[2]</b>	

Question			Answer	Mark	Guidance
7	a	1	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 2px;">A</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 2px;">C</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">B</div>	2	Three correct answer for 2 marks One or two correct for 1 mark
		ii	5 N (1)	1	
	b		<p>speed decreases (1) because of friction with ground / air resistance / counterforce from grass (owtte) (1)</p>	2	<p>interpreting graph for 1 mark explaining change of speed for 1 mark</p> <p><b>reject</b> "speed increases first and then decreases"</p>
			<b>Total</b>	<b>[5]</b>	

Question		Answer	Mark	Guidance
8	a	$70 \times 5$ (1)	1	
	b	200 (1)	1	Ignore any extra units added
	c	B (1)	1	
	d	force (1) work (1)	2	
<b>Total</b>			<b>[5]</b>	
9	a	$\frac{1}{2} \times 50 \times 8^2$	1	
	b	any three from: GPE decreases ; because height (above ground) decreases ; KE increases ; as GPE is converted to KE / energy is conserved ;	3	credit "change in GPE not equal to change in KE because some energy is transferred as heat"
<b>Total</b>			<b>[4]</b>	
<b>Total</b>			<b>[42]</b>	

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