

Additional Science A

General Certificate of Secondary Education

Unit **A218/01**: Ideas in Context (Foundation Tier)

Mark Scheme for June 2012

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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:

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
<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:

✗
✗

*This would be worth
1 mark.*

✓
✗

*This would be worth
0 marks.*

✗
✗
✓
✓

*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		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

- 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)	(i)	35 or 36.5 only	1	ignore any ranges eg 35 to 32
		(ii)	movement of <u>muscles</u> idea of warming /heating up /suitable energy transfer QWC makes sense on first reading	2 1 (QWC)	OWTTE the second marking point can be gained even if the first point is incorrect ignore 'keeping warm' [this is heat retention, not transfer] ignore 'raises temperature' – stem ignore 'blood pumps faster' ignore 'friction', but look for 'heat' etc
		(iii)	maintenance of a constant [internal environment];	1	OWTTE needs both aspects – maintenance & steady [state] accept keeping temperature the same; keeping the body at the right/optimum temperature; 'controlling' temperature ignore 'keeps body in balance'
		(iv)	(outside the body) skin; (of the blood) brain/hypothalamus;	2	
	(b)	(i)	moderate;	1	
		(ii)	= 5 (%); if the working is $7 \div 140 \times 100$ OR if the working is $7 \div 140 = 0.05$ and nothing else OR if the working is $7 \div 140$ and nothing else, [1]	2	correct answer = 2 marks

Question	Answer	Marks	Guidance
(c)	<p>any 2 from: <u>evaporation</u> (of water); (1)</p> <p>wet clothes give poor insulation; (1)</p> <p>(more) heat loss / water or wet clothes takes in heat; (1)</p>	2	<p>ignore makes you cold / lowers body temperature</p> <p>accept energy for heat</p> <p>N.B. “unable to balance heat loss with heat gain” is in the insert only give mark if clear that heat is lost</p>
(d)	<p>any 2 from: <u>enzymes</u> work more slowly/work less well/stop working / <u>enzymes</u> are not at optimum temperature / <u>enzymes</u> work best at optimum temperature / <u>enzymes</u> optimum temperature is at normal body temperature (36.5-37.5 °C); (1)</p> <p>(rate of) respiration decreases / less respiration; (1)</p> <p>less heat released; (1)</p>	2	<p>ignore enzymes are denatured/killed/destroyed / active site changes shape eg ‘enzymes are denatured and stop working’ (1) for idea of stop working</p> <p>accept respiration stops ignore references to rate of breathing / heart rate etc ignore references to rate of chemical reactions</p> <p>accept energy for heat</p> <p>ignore ideas about organs shutting down</p>
	Total	14	

Answer				Marks	Guidance
2	(a)	(i)	iodine	1	accept I ₂ , I, ignore poor spelling
		(ii)	increases	1	OWTTE
	(b)	(i)	chlorine green/yellow gas; bromine red liquid; allow chlorine is a gas <u>and</u> bromine is a liquid for (1)	2	accept 'vapour' for 'gas' accept colour of bromine as orange or brown
		(ii)	(chlorine is) more or very toxic/poisonous / " small concentrations / amounts cause [serious health] problems"; (chlorine) spreads quickly / is a gas;	2	ignore harmful/dangerous/ deadly etc accept 'it is more reactive' allow RA e.g. bromine is a liquid ignore melting point/boiling point
		(iii)	coughing; vomiting; lung damage;	1	any 2=1 mark accept even if both on the same line ignore any incorrect answers
	(c)	(i)	corrosive [only]	1	'corrosive and harmful' = 0 [list principle]
		(ii)	gloves / avoid contact with skin; mask/breathing apparatus / fume cupboard;	1	both needed ignore any other answers ignore 'mask over mouth'
	(d)		chlori <u>ne</u> + sodium iodi <u>de</u> → iodine (1) + sodium chlori <u>de</u> (1)	2	one mark is for getting three things correct the last mark is for getting 'sodium chloride' correct symbol equation must use correct symbols but need not be balanced correctly [accept 'Cl' instead of 'Cl ₂ ' or 'I' instead of 'I ₂ ', as this is low level]
	(e)	(i)	17	1	
		(ii)	2.8.7	1	
			Total	13	

Question		Answer	Marks	Guidance
3	(a)	63/181 or 0.3(48....)	1	
	(b)	<i>any 2 from:</i> [spin] faster; (1) increase strength of magnet/magnetic field; (1) increase number of turns in coil; (1)	2	ignore use iron core accept 'use a [step-up] transformer' as an additional point
	(c) (i)	links cable to 0.858 [GW], AND links transformers to BOTH 0.142 & 0.157 [GW] [or 0.299] correct comparison statement <u>less</u> loss through transformers/ <u>more</u> loss through cable;	2	unqualified answer – assume to be about transformers “cables are 0.858, transformers are ONLY 0.299” [2 marks] [the word ‘only’ shows the comparison] “cables lose 0.559 GW more than transformers” = 2 “cables lose three times the energy of the transformers” = 2
	(ii)	(electric) current / resistance [any context must be suitable] makes cables/wires hot	2	“they” refers to the cables unless otherwise qualified ignore ‘energy transferred’ STEM
	(d)	alternating or a.c. (1) 230 (1)	2	
	(e)	<i>any 4 from:</i> magnet/electromagnet spins; (1) inside/beside coil of wire; (1) idea of changing/ cutting through the magnetic field; (1) voltage produced; (1) induced/electromagnetic induction; (1)	4	ignore moves magnet / moves magnet in and out accept “through the coil” for MP2 ignore the coils spin / the generator spins accept emf/ potential difference/volts for voltage if a context for induction is given, must be in terms of voltage [or current] ignore produces a current ‘a voltage is induced’ is (2) for MP4 and MP5
Total			13	

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