

GCSE

Additional Applied Science

Unit **A192/01**: Science of Materials and Production
(Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2015

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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

	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

- 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 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, 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 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, e.g. 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.

E.g. 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	Mark	Guidance
1	a		tension	1	
	b	i	10;	1	
		ii	40 000 ; 509.55 ;	1 1	accept 509.6, 509.5, 509 or 510, no ecf from incorrect weight
	c		quality; consistency;	1 1	

Question			Answer	Mark	Guidance
2	a	i	any one of the following: <ul style="list-style-type: none"> • fibreglass • kevlar • concrete 	1	not carbon fibre
		ii	named material in a named matrix (2) general description of a composite material (1)	2	named material / matrix for composite of (i) e.g. (fibreglass is) glass fibres in resin matrix e.g. fibres in a matrix / one material embedded in another accept a description of a composite which is not their choice from (i) for [1]
	b		any one of the following properties and reasons: <ul style="list-style-type: none"> • strength <ul style="list-style-type: none"> ◦ so that they don't break • kite mark / CE mark <ul style="list-style-type: none"> ◦ meets product standards / has been tested / is good quality • durability / toughness <ul style="list-style-type: none"> ◦ so that they last a long time 	2	look for a reasonable property [1] with a valid reason [1]
	c		metal - strong and tough polymer - flexible and low density ceramic - brittle and hard	2	completely correct [2] one or two correct [1]

Question	Answer	Mark	Guidance
3	<p>[Level 3] Justifies and explains both aspects of theatre construction. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] EITHER justifies and explains an aspect of theatre construction OR justifies or explains both aspects of theatre construction. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Justifies or explains one aspect of theatre construction. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to E.</p> <p>Indicative science points may include:</p> <p>explanation justification</p> <p>wood reflects sound from stage to audience</p> <p>actors/band need less volume helps audience hear actors/band</p> <p>tiles absorb sound from stage reducing echo from walls {stops sound escaping from hall}</p> <p>less confusing for audience clearer sound from stage {doesn't disturb people outside}</p>

Question			Answer	Mark	Guidance
4	a	i	C	1	
		ii	any one of the following property-reason pairs: <ul style="list-style-type: none"> • low density <ul style="list-style-type: none"> • so that it isn't heavy / is light • waterproof <ul style="list-style-type: none"> • so that it isn't affected by rain • opaque <ul style="list-style-type: none"> • so that light doesn't get in • tough / strong / durable <ul style="list-style-type: none"> • doesn't break (easily) in use 	2	accept reasonable property [1] with valid reason [1] ignore stiff / rigid
	b	i	diverging / concave; thinner in middle / thicker at outside / spreads out rays;	1 1	accept negative
		ii	any two of the following for [1] each: <ul style="list-style-type: none"> • lots of red and green gets through; • little blue gets through / most blue is absorbed; • red and green light appears yellow; 	2	look for words, not percentages accept makes yellow

Question		Answer	Mark	Guidance
5		<p>[Level 3] States a point for each of the aspects of the supply chain. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] States some points from more than one aspect of the supply chain. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] States a point from any aspect of the supply chain. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to E</p> <p>Indicative science points may include:</p> <p>husbandry grow grass / food for goats to eat provide shelter for goats monitor goats for disease extract milk from goats</p> <p>treatment heat / pasteurise / sterilise milk test milk for quality cool <u>and</u> store</p> <p>delivery transport to processing factory bottle / package label with origin / use-by date transport to supermarket</p>

Question		Answer	Mark	Guidance
6	a	30 litres	1	
	b	50 g in 5 litre; $50 \times (300/5) = 300$ (g);	2	<p>correct answer earns [2] 50 g in 3 litres gives 500 g for [1] allow ecf from (a) for [2]: 5 litres gives 50 g 150 litres gives 1500 g 750 litres gives 7500 g</p>

Question		Answer	Mark	Guidance
7	a	magnesium carbonate; sodium sulfate;	1 1	in any order
	b	<p>[Level 3] Explains two linked processes in the procedure. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Describes two linked processes in the procedure. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Describes one process in the procedure. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C.</p> <p>Indicative science points may include:</p> <ul style="list-style-type: none"> • description of step <ul style="list-style-type: none"> • explanation for step • mix solutions together <ul style="list-style-type: none"> • to form (precipitate of) magnesium carbonate • pour through filter paper <ul style="list-style-type: none"> • to separate crystals/precipitate from solution • pour water through filter paper <ul style="list-style-type: none"> • to wash/clean the crystals • place filter paper in oven <ul style="list-style-type: none"> • to evaporate water (to dry the crystals) <p>accept decanting instead of filtering</p>

Question		Answer	Mark	Guidance
8	a	there isn't a place where everyone ate;	1	accept not everyone ate the same thing not they all ate at more than one place not they all ate at different places
	b	EITHER poisoned food (probably) from Best Pizza Parlour; largest number of people (five) ate there; OR least likely to be at Fresh Fish (or Quick Pasta); only one person ate at each of these;	1 1	not you can't be sure where it happened
	c	fungus; virus;	1 1	accept yeast / mould as fungus ignore bacteria
	d	named product food e.g. wine, yogurt; THEN either named microorganism e.g. yeast, bacteria or named source food e.g. fruit, milk;	1 1	For example: wine from yeast and fruit (juice) beer from yeast and barley bread from yeast and wheat yogurt from bacteria and milk cheese from bacteria and milk probiotics from bacteria and milk mycoprotein (quorn) from fungi and sugar

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