OCR
RECOGNISING ACHIEVEMENT

GCSE

Applied Science: Double Award

General Certificate of Secondary Education **B482/02**

Unit 2: Science for the needs of Society

Mark Scheme for June 2010

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Question			Expected Answers	Marks	Additional Guidance
1	a		solution	1	
	b		liquid gas; gas liquid; both lines in correct order (3) liquid / gas either order line 1 (1) liquid / gas either order line 2 (1)	3	
	c	i	saves (space in) landfill; saves metal resources / metal can be used to <u>make</u> new products / re-use the <u>metal</u>; metals will run out; no need to mine more; recycling uses less energy;	any 2	**Ignore** 'less waste' or 'saves wasting metals' saves metals alone = 0 Accept making named product e.g. new spray can. **Ignore** 're-using the spray can' or 're-using it' alone **Ignore** carbon footprint arguments / litter **Ignore** references to the environment or less pollution **Ignore** cheaper
		ii	have to separate /sort materials / idea that it is a mixture / not just metals / made of different metals / alloy / still contains <u>gas</u> / pressurised idea	1	**Ignore** 'explosion' or 'flammable' alone **Ignore** liquids / other contents inside the can
	d	i	carbon / C <u>and</u> hydrogen / H (1)	1	need both **Do not accept** h or H_2 or CH_3 / CH_2 etc

		ii	(below) boiling point / below 16 °C; turn to liquid; gas does not force contents out / less pressure (in can)	2	**Ignore** references to solids
			Total	**10**	

Question			Expected Answers	Marks	Additional Guidance
2	a	i	idea of movement; plates (tectonic);	2	**Allow** 'continental drift' or 'continents move' for first mark **Allow** 'separate' for 'move' **Allow** 'breaks away' or 'splits away' but not 'breaks' or 'splits' alone.
		ii	mountain / ocean formation;	1	**Reject** short term changes e.g. earthquakes / volcanoes / erosion / environmental effects **Ignore** land formation / sea level change
	b	i	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**	

Question			Expected Answers	Marks	Additional Guidance
3	a		to vaporise / evaporate it / turn to gas	1	
	b		TFTFT	3	all 5 correct = 3 4 correct = 2 2/3. correct = 1 1 correct = 0
	c	i	fuel gas any 2 (1) petrol diesel	1	
		ii	kerosene and bitumen have a bigger supply than demand; petrol has a bigger demand than supply; producing petrol / using more crude oil also produces bitumen / kerosene	any 2	
		iii	smaller molecules demand outstrips supply; the <u>supply</u> of smaller molecules is increasing; larger molecules supply outstrips demand; the <u>supply</u> of larger molecules is decreasing;	2	AW
	d		making polymers / plastics / lubricants / cosmetics / bitumen on roads / paint / dyes	1	Do not accept cooking
			Total	**10**	

Question			Expected Answers	Marks	Additional Guidance
4	a		**all three** names in boxes correct: human/hunters, vole grass; (1) **all three** arrows correct: heather →voles heather → grouse grouse →humans (1)	2	 Arrows must be in correct direction Allow ecf from names
	b		foxes eat / kill grouse; hence more grouse; better for shooting / business	any 2	ACCEPT predators for foxes This marking point is looking for a commercial idea
	c	i	more foxes eat more voles;	1	'less voles' alone is not enough needs idea of **more** foxes e.g. less foxes killed
		ii	number of voles decreases; more grouse eat more plants; less food for voles;	any 2	
	d		choose high flying / best grouse; breed together; select highest flying / best offspring; idea of repeating (over generations);	any 2 1	marking points are independent assume 'bird' means grouse
			Total	**10**	

Question			Expected Answers	Marks	Additional Guidance
5	a	i	conduction; convection; radiation;	3	
		ii	<u>conduction</u> particles vibrate; hot particles vibrate more; collide with cooler particles; pass energy on (from particle to particle); OR (free) electrons; collide with cooler atoms; pass (KE) to other atoms <u>convection</u> hot particles move apart; (hot) particles rise; as cool particles fall;	any 2 any 2	NOT particles expand **Allow** density e.g. hot fluid has lower density (1). Rises through cooler/less dense fluid (1). ora
		iii	air gap stops conduction; shiny surface prevents radiation / reflects heat energy; 2 thicknesses of glass panes, reduces conduction; convection on <u>outside</u> surface reduced;	any 2	
		b	energy used ÷ energy in x 100; 150 000 ÷250 000 x 100; 60	3	Allow 2 marks for 0.6 60 gains all 3 marks
			Total	**12**	

Question			Expected Answers	Marks	Additional Guidance
6	a		glucose: $C_6H_{12}O_6$; oxygen, carbon dioxide and water: O_2, CO_2, H_2O; balanced: $C_6H_{12}O_6 + \mathbf{6}O_2 \rightarrow \mathbf{6}CO_2 + \mathbf{6}H_2O$;	1 1 1	Formula must be correct with subscripts, all capitals. Ignore balancing numbers for first 2 mark points
	b	i	aerobic produces more energy	1	Accept no lactic acid produced.
		ii	removing lactic acids requires oxygen; oxygen debt is this extra oxygen requirement; lactic acid breaks down over time	any 2	
	c		increased CO_2 in blood; detected by brain;	2	
			Total	**8**	

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