

Science A

General Certificate of Secondary Education **A214/01**

Unit 4: Ideas in Context

Mark Scheme for June 2010

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Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

Question		Expected Answers	Marks	Additional Guidance	
1	a	<p>any two from: antibiotic resistant strains of TB appearing (1) <u>few(er) / less</u> people are being vaccinated (1) people have come from countries <u>where they do not vaccinate</u> (1) idea that vaccine is not 100% (successful / effective) (1) vaccine does not give immunity for life (1) idea that badgers and / or cattle act as possible reservoir of infection (1)</p>	[2]	<p>ignore idea of going away on holiday and bringing it back.</p> <p>ignore reference to other animals</p>	
	b	<p>any two from: (vaccine) not 100% (successful) / idea that TB becomes resistant / mutation (1) may not provide life time immunity (1) all cattle may not be vaccinated (1)</p>	[2]	<p>must relate to the vaccine not badgers / cattle / antibiotics references to viruses are neutral</p>	
	c	<p>Peter (1) Ranjit (1)</p>	[2]		
	d	i	Peter (1)	[1]	
		ii	Ranjit (1)	[1]	
	e	<p>any two from: the results will vary / there will be a range of results (1) the average will be a more reliable/accurate/best estimate (1) idea of outliers/idea of combining results (1)</p>	[2]	<p>accept more likely to be right</p> <p>procedural point</p>	

Question		Expected Answers	Marks	Additional Guidance
1	f	when more badgers culled/killed the number of TB cases in cattle increases (1)	[1]	reject more badgers means more TB accept when badgers move more the number of TB cases in cattle increases
	g	any two from: less movement of cattle (1) test cattle prior to movement (1) quarantining cattle (1) more / frequent / regular TB tests (1)	[2]	ignore better cattle control ignore vaccine for badgers ignore keep cattle separate
		Total	[13]	

Question			Expected Answers			Marks	Additional Guidance
2	a	i	americium	✓		✓	[3] one mark per column
			caesium		✓	✓	
			plutonium	✓		✓	
			strontium		✓	✓	
				(1)	(1)	(1)	
		ii	any two from: killed; become cancerous; mutate / damage / harmed;			[2]	answers must be about effect on cells allow more detail, eg create ions in cell (1) which take place in chemical reactions (1) if clear not cells ionised ignore 'burned'
2	b		any two from: radiation / radioactivity / fallout; cancer; mutations; radiation poisoning / radiation sickness / damage to named area of body / hair fall out; death;			[2]	answers must be about humans and not cells reject extreme alarmist eg blow up world reject direct harm caused by blast etc ignore just 'damage' or 'illness' or 'sickness' on its own or 'poisoning'
	c		describe benefit: eg unspoiled sea / tropical climate / not crowded (1) idea of risk being small: eg close to background radiation / only a little will have leached from rocks into sea / radiation diluted / only spend a little time in sea (1) QWC is given for mention of benefit and risk qualified or unqualified (1)			[3]	any mention of benefit and risk will gain QWC 'benefit outweighs risk' by itself = QWC mark only

Question			Expected Answers	Marks	Additional Guidance
	d	i	sand 20% (1) coral 14% (1)	[2]	
		ii	(at 20 cm), <u>10%</u> (penetrates) (1) this is 10 times/x smaller / 10% of 100 (1)	[2]	
			Total	[14]	

Question		Expected Answers	Marks	Additional Guidance
3	a	any two from: inability to concentrate; excessive activity / hyperactivity (1); impulsive behaviour;	[2]	reject any other symptoms
	b	make them look more attractive/colourful/want to drink it / make people buy them / easier to sell / replace natural colours / make colour match the flavour (1)	[1]	ignore reference to taste or smell
	c	i sodium benzoate / E211 (1)	[1]	allow just "benzoate" reject just "sodium"
		ii sunset yellow / E110 (1) carmoisine / E122 (1)	[2]	for each additional answer reduce mark by one
		iii idea of a control / to allow comparison / to see if water has same effect / to see what effect water has / placebo effect (1)	[1]	ignore fair testing
	d	any two from: it is a small study / not many children were in the study; the study only included children / only 3-year olds and 8-year olds; idea that study carried out in only one area;	[2]	accept additives were not tested separately ignore 'needs more research' or 'not enough information'

Question			Expected Answers	Marks	Additional Guidance
3	e	i	<p>any two from: do not know about the risks / consider the risks to be small / FSA say its safe / not enough evidence; these drinks are cheaper; their children prefer these drinks; idea of badgering / pestering by / pandering to children; longer shelf life;</p>	[2]	
		ii	<p>any two from: allergy ideas / some children may have bad reaction / effect; contamination ideas eg pesticides, plasticizers; example of effect of named ingredient; unknown long-term effects (of named ingredient); could choke;</p>	[2]	<p>eg drink may be OK for nearly all people but may cause harm to a few answer must state or imply that only some children are affected and the effect is bad.</p> <p>problems caused eg sugar rots teeth / sugar affects diabetes / sugar causes obesity / acids dissolve teeth ignore answers about hyperactivity or impulsive behaviour. accept any plausible example</p>
			Total	[13]	

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

14 – 19 Qualifications (General)

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

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