



Rewarding Learning

General Certificate of Secondary Education
2010–2011

Science: Single Award (Modular)

Chemical Patterns and our Environment
Module 3

Higher Tier

[GSC32]

TUESDAY 9 NOVEMBER 2010, AFTERNOON

**MARK
SCHEME**

			AVAILABLE MARKS	
1	(a)	More people indoors [1] or implied People asleep/slow to react [1] Any two	[2]	9
	(b)	Effects are too weak [1] Small, not much damage [1] Not recognised as an earthquake [1] Any two	[2]	
	(c)	5	[1]	
	(d)	Earth is made up of plates which move [1] When they rub past each other (they cause friction) [1] It happens below the ground/no advanced warning/ cannot detect stresses set up [1]	[3]	
	(e)	It could save lives or implied	[1]	
2	(a)	Chromatography	[1]	6
	(b)	The black dye contains E102 and E142 [1] It does not contain E122 [1] It does contain an illegal dye [1] Black dye contains 3 dyes [1] Any three	[3]	
	(c)	Animals may suffer Animals cannot say no It avoids harming humans It helps to find out if the dye is safe Any two Answer must include at least one advantage and one disadvantage	[2]	
3	(a) (i)	17	[1]	7
	(ii)	Number of protons + neutrons in an atom	[1]	
	(b)	Electron	[1]	
	(c)	A $35 - 17 = 18$ [1] B $37 - 17 = 20$ [1]	[2]	
	(d)	3 shells [1] 2, 8, 7 [1]	[2]	

			AVAILABLE MARKS	
4	(a) (i)	NaHCO_3 [1]	[1]	10
	(ii)	Baking soda breaks down [1] in the heat [1] to produce CO_2 [1] Accept equation [3]	[3]	
	(b)	Vinegar is an acid [1] it reacts with the baking soda/neutralises to produce more carbon dioxide [1] [2]	[2]	
	(c)	Sherbet [1]	[1]	
	(d)	\longrightarrow sodium citrate [1] + water [1] + carbon dioxide [1] [3]	[3]	
5	(a) (i)	Oxygen [1]	[1]	
	(ii)	It contains two or more different elements [1] chemically joined [1] [2]	[2]	
	(b) (i)	Neutralisation [1]	[1]	7
	(ii)	$\text{Mg}(\text{OH})_2 + 2 \text{HCl} \longrightarrow \text{MgCl}_2 + 2 \text{H}_2\text{O}$ [2] for correct products [1] for balancing [3]	[3]	
6	(a)	Earth, fire, wind, water [1]	[1]	
	(b)	Law of octaves/the eighth element was a repetition of the first [1]	[1]	
	(c)	For undiscovered elements [1]	[1]	
	(d)	Because iodine properties fitted better in this other position [1]	[1]	
	(e)	It is arranged in atomic number order [1] which is the number of protons in an atom [1] The number of electrons in the outer shell is the same as the group number [1] Any two [2]	[2]	
Total				45