



WJEC Chemistry 1
Dual Award – Foundation Tier
1.4 Mark Scheme

Common questions

Question	Marking details	Marks Available														
		AO1	AO2	AO3	Total	Maths	Prac									
7/1 (a) (i)	<p>less carbon dioxide today / carbon dioxide has decreased (1)</p> <p>now contains oxygen / oxygen has formed / oxygen has increased / more oxygen today (1)</p> <p>award (1) for numerical value given for the present day percentage of either gas e.g. 21% oxygen, 0.04% carbon dioxide (or correctly calculated change from pie chart)</p>	3			3											
(ii)	<table border="1"> <thead> <tr> <th>gas</th> <th>test carried out</th> <th>expected observation</th> </tr> </thead> <tbody> <tr> <td>hydrogen</td> <td>put a <u>lit splint</u> into the gas</td> <td>there is a squeaky pop and the splint goes out</td> </tr> <tr> <td>carbon dioxide</td> <td>bubble the gas through <u>limewater</u></td> <td>the limewater goes from clear to <u>milky</u></td> </tr> </tbody> </table> <p>award (1) for each correct test and observation award (1) if both tests given but incorrect observation(s)</p>	gas	test carried out	expected observation	hydrogen	put a <u>lit splint</u> into the gas	there is a squeaky pop and the splint goes out	carbon dioxide	bubble the gas through <u>limewater</u>	the limewater goes from clear to <u>milky</u>	2			2		2
gas	test carried out	expected observation														
hydrogen	put a <u>lit splint</u> into the gas	there is a squeaky pop and the splint goes out														
carbon dioxide	bubble the gas through <u>limewater</u>	the limewater goes from clear to <u>milky</u>														
(b) (i)	(average global) temperatures have increased (1) <p>(average global) temperatures have increased by greater amounts over time / have increased exponentially (2)</p>		1													
(ii)	3.60% (2) accept 3.59 / 3.597 / 4.0 <p>award (1) for reference to an increase of 10 ppm ecf possible for incorrect subtraction</p>		2		2		2									
	Question 7/1 total	5	3	1	9	4	2									

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths	Prac
6	<p>Indicative content</p> <ul style="list-style-type: none"> respiration uses oxygen and produces carbon dioxide this decreases oxygen levels and increases carbon dioxide levels photosynthesis uses carbon dioxide and produces oxygen this increases oxygen levels and decreases carbon dioxide levels the two processes have taken place at broadly the same rate over a long period of time deforestation is reducing the number of plants available to produce oxygen and reduce carbon dioxide in the atmosphere combustion of more and more fossil fuels over the past 100-200 years is adding to the amount of carbon dioxide in the atmosphere global warming <p>5-6 marks Good description of oxygen and carbon dioxide in respiration and photosynthesis; understanding of the changing balance <i>There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</i></p> <p>3-4 marks Basic description of oxygen or carbon dioxide in respiration and photosynthesis; reference to deforestation or combustion of fossil fuels <i>There is a line of reasoning which is partially coherent, largely relevant, supported by some evidence and with some structure. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</i></p> <p>1-2 marks Simple reference to oxygen or carbon dioxide in respiration or photosynthesis <i>There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with very little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</i></p> <p>0 marks <i>No attempt made or no response worthy of credit.</i></p>	6			6		
Question 6 total		6	0	0	6	0	0

Common questions

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
7/1	(a)	<p>(i)</p> <p>all points plotted correctly (2) 5/6 points plotted correctly (1) tolerance $\pm 1/2$ small square suitable curve (1)</p>		3		3		
	(ii)	<p>increase until 1980/1990/late 1980s (allow specified year e.g. 1987) (1)</p> <p>decrease after 1980/1990/late 1980s (allow specified year e.g. 1987) (1)</p> <p>award (1) only for simple statement referring to an initial increase followed by a decrease</p>			2	2		
	(iii)	<p>award (1) for any of following</p> <ul style="list-style-type: none"> only one reading every 10 years 10 years between every reading graph does not go up one year at a time emissions very similar in 1980 and 1990 and there is no way of knowing what happened in between there could have been a lag in the reduction of sulfur dioxide emissions after the regulation came into force 			1	1		
	(b)	<p>$\text{SO}_2 + 2\text{H}_2\text{S} \rightarrow 3\text{S} + 2\text{H}_2\text{O}$</p> <p>$\text{H}_2\text{O}$ (1) balancing (1)</p> <p>balancing mark only awarded if H_2O correct</p>		2		2	1	
		Question 7/1 total	0	5	3	8	4	0

Question	Marking details	Marks available					Maths	Prac					
		AO1	AO2	AO3	Total								
4	(a)	magma rises through the gap (1) award (1) for any of following <ul style="list-style-type: none"> • magma then cools to form new rock / mid-ocean ridge • magma then forms a volcano 	2			2							
	(b)							(i)	oceanic plate is denser/heavier than the continental plate	1		1	
								(ii)	oceanic plate melts / turns to magma / turns to molten rock earthquakes occur / new mountain ranges form - neutral answers	1		1	
								(iii)	destructive	1		1	
	(c)	0.895 / 0.90 / 0.9 (2) if answer incorrect award (1) for $\frac{537}{600}$	1	1		2	2						
		Question 4 total	6	1	0	7	2	0					

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
5	(a)	its density is 1.7 g/cm^3						
		its melting point is 650°C						
		it fizzes vigorously with sulfuric acid	<input checked="" type="checkbox"/>		1	1		1
		it is malleable	<input type="checkbox"/>					
	(b)	it does not react with sulfuric acid	<input type="checkbox"/>					
		it is ductile	<input type="checkbox"/>					
		it would melt when it lands on planet J	<input checked="" type="checkbox"/>		1	1		
		its density is 11.3 g/cm^3	<input type="checkbox"/>					

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths	Prac
(c)	award (1) for each correct answer it does not react with sulfuric acid <input checked="" type="checkbox"/> it is expensive <input type="checkbox"/> it is a good conductor of heat <input type="checkbox"/> it is non-magnetic <input type="checkbox"/> it has a melting point much higher than the temperature on planet J <input checked="" type="checkbox"/> it is shiny so will reflect the sun's rays <input type="checkbox"/> if three boxes ticked each incorrect answer negates a correct one 0 if four or more boxes ticked			2	2		
(d)	$2\text{Na} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2$ award (1) for correct formula Na_2SO_4 award (1) for balancing only if Na_2SO_4 given		2		2	1	
	Question 5 total	0	2	4	6	1	1

9/12	Question	Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
		temperature decreased (1) water vapour condensed to form oceans (1)	2			2		
		award (1) each for any two of following <ul style="list-style-type: none"> • (green) plants evolved which carried out photosynthesis • carbon dioxide absorbed by the oceans • carbon dioxide absorbed by shells of marine organisms / trapped in limestone rock • carbon dioxide trapped in fossil fuels 	2			2		
	(b)	increase in percentage of carbon dioxide due to burning of fossil fuels / deforestation (1) award (1) for any of following <ul style="list-style-type: none"> • climate change • more extreme weather • more drought conditions • polar ice caps melting at a <u>higher rate</u> • rising sea levels • <u>more</u> flooding • loss of wildlife habitat accept other sensible answers	2			2		
	(c)	$4\text{NH}_3 + 3\text{O}_2 \rightarrow 2\text{N}_2 + 6\text{H}_2\text{O}$		1		1	1	
		Question 9/12 total	6	1	0	7	1	0

Question	Marking details	Marks available							
		AO1	AO2	AO3	Total	Maths	Prac		
4									
(a)	<p>Water vapour evaporated to form clouds <input type="checkbox"/></p> <p>The Earth cooled so water vapour condensed <input checked="" type="checkbox"/></p> <p>Bacteria and algae turned the water vapour into liquid water <input type="checkbox"/></p> <p>There were no more volcanoes to produce water vapour <input type="checkbox"/></p>		1		1				
(b)	<p>carry out photosynthesis / use up carbon dioxide (1)</p> <p>produce oxygen (1)</p>		2		2				
(c)	argon / Ar	1			1				
(d)	$2\text{NaN}_3 \longrightarrow 2\text{Na} + \boxed{3} \text{N}_2$		1		1	1	1		
	Question 4 total	3	2	0	5	1	1	0	

Question	Marking details	Marks available								
		AO1	AO2	AO3	Total	Maths	Prac			
9/2	(a)	(i)	award (1) each for any of following							
			<ul style="list-style-type: none"> different continents fit together like a jigsaw puzzle similar fossils found on different continents similar rocks found on different continents neutral answers different countries fit together like a jigsaw puzzle different continents / countries have similar coastlines same animals / plants found on different continents	3			3			
		(ii)	he could not suggest <u>how/why</u> the continents moved (1) neutral answer – no evidence to support his theory award (1) for either of following <ul style="list-style-type: none"> we now know that the continents are on <u>huge/tectonic</u> plates that can <u>move</u> we now know that tectonic plates are moved by <u>convection currents in the mantle</u> below the Earth's crust (1) neutral answers plates were discovered plate boundaries were discovered	2			2			
	(b)		earthquake	1			1			
			Question 9/2 total	6	0	0	6	0	0	