



# **PATHWAYS MARKING SCHEME**

**LEVEL 1 / 2 AWARD IN SCIENCE FOR  
WORK**

**SUMMER 2014**



## **INTRODUCTION**

The marking schemes which follow were those used by WJEC for the Summer 2014 examination in LEVEL 1 / 2 AWARD IN SCIENCE FOR WORK. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.



## SCIENCE FOR WORK (IVQ)

Question	Marking Point	Additional Guidance	Mark
1	<b>A</b> = Photosynthesis <b>B</b> = Respiration <b>C</b> = Decomposition		1 1 1
2	(a) (i) Any two of: <ul style="list-style-type: none"> <li>• water vapour</li> <li>• carbon dioxide</li> <li>• nitrous oxide</li> <li>• methane</li> </ul> (ii) Campaign/lobbying/protest group	Allow: organises demonstrations	2  1
	(b) (i) Carbon footprint is the sum/total (1) of emissions of greenhouse gases/methane/carbon dioxide (1) (which are produced by an organisation's activities in a given time frame)		2
	(ii) Plants take in carbon dioxide when they grow (1) therefore the net change in CO <sub>2</sub> is zero/carbon use is offset by growing trees (1)	Allow: higher level answers involving photosynthesis	2
	(c) (i) Turbine, generator		2
	(ii) Oxygen, carbon dioxide	Allow correct formulae	2
	(d) (i) 65 000 x 100/100 000(1) 65% (1)	Both marks for just answer	2
	(ii) Thermal, sound	Allow heat for thermal	2

Question	Marking Point	Additional Guidance	Mark	
<b>3</b>	(a)	Doesn't burn fossil fuels / produce CO <sub>2</sub>	Allow 'There is enough range on single charge'	1
	(b)	280 x 27, 7560g	Both marks if the correct answer is given	2
	(c)	Any two of: <ul style="list-style-type: none"> <li>encourages us to buy EV's</li> <li>make them cheaper</li> <li>meets (government) targets on CO<sub>2</sub> production / decrease carbon footprint</li> </ul>		2
	(d)	Any two of: <ul style="list-style-type: none"> <li>data is true for first 100 km,</li> <li>runs on battery for first 80 km / only uses petrol for 20 of first 100 km</li> <li>beyond 100 km both cars run on just petrol</li> </ul>		2
	(e) (i)	50 x 8, 400 kwh	Both marks if the correct answer is given	2
	(ii)	400 x 0.45, 180kg	Allow ecf. Both marks if the correct answer is given	2
<b>4</b>	(a) (i)	A measure of how much <u>more</u> than CO <sub>2</sub> a gas contributes to global warming / Effect of the gas on GW compared to CO <sub>2</sub>		1
	(ii)	Amount of gas x GWP		1
	(b) (i)	50 billion x 25 (1) 1250 billion kgCO <sub>2</sub> Eq (1)		2
	(ii)	25 billion x 25 (1) + 1 billion x 300 (1) 925 billion kgCO <sub>2</sub> Eq (1)	Allow ecf	3
	(iii)	Reduces it (1) Saves 325 billion kgCO <sub>2</sub> Eq (1)	Allow ecf from b(i) and b(ii)	2

Question	Marking Point	Additional Guidance	Mark
5 (a) (i)	Overall increase (1) faster since 1980/not constant / fluctuates / no overall increase between 1940-1980 (1)		2
(ii)	Any two of: <ul style="list-style-type: none"> <li>• climate change or more extreme weather</li> <li>• ice caps melt</li> <li>• change in what plants can be grown</li> </ul>	Allow: Changes in animal populations, loss/gain of habitat.	2
(b) (i)	Plotting (half square tolerance): All correct(2) six correct (1) curve		3
(ii)	Similar shape (1) CO <sub>2</sub> causing raise in temp (1)	Allow for 2 marks temperature increases as CO <sub>2</sub> increases	2
(iii)	Any two of: <ul style="list-style-type: none"> <li>• energy from sun absorbed by Earth</li> <li>• energy radiated out as IR or lower frequency</li> <li>• this is absorbed by greenhouse gases in atmosphere</li> <li>• atmosphere warms up</li> </ul>	Any 2 points in correct order allow named greenhouse gas	2

Question	Marking Point	Additional Guidance	Mark
6	<ul style="list-style-type: none"> <li>• Agreement signed by governments</li> <li>• to limit the amount of greenhouse gas produced</li> <li>• legally binding targets</li> <li>• use of carbon trading</li>   <li>• Governments have increased use of renewables</li> <li>• reduced deforestation</li> <li>• planted more trees to offset carbon</li> <li>• encouraged insulation of homes and factories</li> <li>• increase recycling</li>   <li>• Not all governments signed agreements</li> <li>• only apply to a small percentage of greenhouse gases</li> <li>• not all greenhouse gases man-made.</li> </ul>	Max. of 2 marks from each paragraph	5