

Commentary on candidate 3 evidence

The effect of different substrates on the rate of respiration

The evidence for this candidate has achieved the following marks for each section of this course assessment component.

Section	Mark available	Mark awarded	Comments	
1 Aim	1	1	The aim of the investigation is clearly stated.	
2 Underlying biology	4	4	<p>More than four expanded descriptions/explanations, that are relevant to the aim, are given at a depth appropriate to Higher level:</p> <ul style="list-style-type: none"> ◆ 1 mark (lines 5 – 10) – ‘During the first half... energy payoff phase.’ ◆ 1 mark (lines 10 – 15) – ‘In the energy... forming NADH.’ ◆ 1 mark (lines 19 – 22) – ‘Carbon dioxide... acetyl coenzyme A.’ ◆ 1 mark (page 2, lines 3 – 8) – ‘The electron transport... across the membrane.’ ◆ 1 mark (page 2, lines 8 –11) – ‘As the return ... form water.’ <p>Although more than four expanded descriptions/explanations are given only 4 marks can be awarded.</p> <p>No mark was awarded for the citric acid cycle description (bottom of page one) as acetyl CoA does not combine with oxaloacetate.</p>	
3 Data collection and handling	5	a	0	The equipment used to measure the dependent variable is not mentioned (stopwatch). Too many references to volumes, temperature and time are given making this description more like a protocol than a summary.
		b	1	Repeated measurements are included and the raw (unprocessed) data is sufficient, ie 4 different substrates.

Section	Mark available	Mark awarded	Comments
		c 0	The heading of 'Time taken to respire' does not clearly indicate what is being measured.
		d 1	A bar chart is included showing the respiration rate of the same four substrates as the candidate's own experiment.
		e 0	A full URL is provided with the data rather than a citation.
4 Graphical presentation	4	a 1	The graph produced is based on the candidate's experimental data. A bar graph has been selected which is the appropriate format for this data.
		b 1	Both axes have suitable scales.
		c 1	Both axes have suitable labels and units.
		d 1	All values are plotted correctly and bars with clear tops are drawn.
5 Analysis	1	0	The identification of three sugars in common is correct but stating maltose is the quickest in the internet source is incorrect. Nowhere in the report has the candidate made the link between the indirect measurement (time taken for colour to change) and the rate of respiration.
6 Conclusion	1	0	As the internet data shows the substrates ranked in a different order to the experimental data, no conclusion can be drawn relating to the order of substrates and the rate of respiration. It would be acceptable to state that no conclusion could be drawn, with justification for this provided.
7 Evaluation	3	1	1 mark was awarded for identifying human judgement as a source of error and justifying the use of a colorimeter instead to improve accuracy. No mark was awarded for the use of a better timer and justification, as a more accurate timer would not allow a better comparison to the other source.

Section	Mark available	Mark awarded	Comments
8 Structure	1	1	An informative title is given and the report flows in a logical manner.
Total	20	13	