

GCSE Science – Investigative Skills Assignment – Marking Guidelines

Biology 3.2 – Pulse Rate and Exercise

For use until May 2009

Last date for submission for moderation May 2010

Please mark in red ink, and use one tick for one mark. Each part of each question must show some red ink to indicate that it has been seen.

Subtotals for each part of each question should be written in the right hand margin.

Please add annotations where necessary to explain why marks have or have not been awarded.

Enter the marks for **Section 1** and **Section 2** and the **total mark** on the front cover of the answer booklet.

The teacher must sign and date the front cover of the ISA.

The papers must be kept in a secure place and must **not** be returned to candidates.

The marking guidelines show examples of typical responses that candidates may make. However, teachers should use their professional judgement in deciding whether or not to award marks. If, in the judgement of the teacher, the candidate has provided a response which correctly answers the question, then a mark should be awarded even if this response is not shown in the mark guidance. If necessary, the teacher should annotate the script and/or mark guidance to justify the decision.

In the mark guidance:

- the use of a solidus (/) indicates an alternative answer
- the use of brackets () indicates wording that is not essential in the candidate's answer, but makes the guidance clearer.

SECTION 1

	Answer	Additional Guidance	
1	Statement referring to change in the dependent variable eg to see if number of pulse rate / heart rate changes	Dependent variable must be identified Just pulse rate / heart rate is not sufficient	1 mark
	Independent variable correctly identified and linked to dependent variable eg ...when I exercise		1 mark
2(a)	Amount of exercise	Accept other variables if appropriate eg type of exercise	1 mark
(b)	By reference to candidate's results table	Figures may be given in eg pulse / beats per 15 s or per minute A check should be carried out that any calculations derived from raw data are correct Units must be shown at least once	1 mark

	Answer	Additional Guidance	
3	eg amount / severity of exercise / gender / body mass / weight / fitness / age	Accept answers that compare individuals in table	1 mark
4	Any one from: eg <ul style="list-style-type: none"> to allow pulse / heart rate to return to resting level so previous exercise has no effect on next one 		1 mark
5	So rate does not decline (too much) / you'd end up taking rate for rest again		1 mark
	Easy to lose count / may lose pulse / get distracted / other sensible suggestions		1 mark
6(a)	Amplified statement for 2 marks eg exercise affects heart / pulse rate for 1 mark plus heart / pulse rate increases with extent of exercise for 2 marks or eg there is no relationship between exercise and heart / pulse rate for 1 mark plus there is no trend / results are random for 2 marks	NB statement must relate to candidate's own results Simple correct statement, stating whether or not there is a relationship between the two variables, for 1 mark	2 marks
(b)	Any one from: eg <ul style="list-style-type: none"> Yes – as the pattern is clear No – there is not enough evidence to see the pattern 	No mark for Yes or No mark is for the reason	1 mark
7	Reliability		1 mark

	Answer	Additional Guidance	
8	Table: Correct headings AND units all correct for all measured variables	Table with incomplete headings or units for the measured variables gains 1 mark eg all headings present = 1 eg all units present = 1	2 marks
	Graph/chart: X axis: suitable scales chosen and labelled with quantity and units	Accept axes reversed	1 mark
	Y axis: suitable scales chosen and labelled with quantity and units		1 mark
	Points or bars plotted correctly to within ± 1 mm	Allow one plotting error out of every 5 points plotted. Allow error carried forward from incorrect plots	1 mark
	Suitable line drawn on graph or bars correctly labelled on bar chart		1 mark
	If wrong type of graph / chart, maximum 3 marks If the independent variable is: <i>continuous</i> should draw a <i>best fit line graph</i> <i>categoric</i> should draw a <i>bar chart</i> <i>discrete</i> may draw either a <i>best fit line graph</i> or a <i>bar chart</i> (but allow dot-to-dot joining of points in this case)		
			Max 18 marks

SECTION 2

9	Decreases	Accept synonyms	1 mark
	Effect reduces (with time)		1 mark
10	Any one from: eg <ul style="list-style-type: none"> • not enough evidence / only one person • heart / pulse rate is not a complete measure of heart fitness • no evidence here of link between pulse rate and heart fitness 		1 mark
11(a)	Grips skin		1 mark
	More fat gives bigger reading		1 mark
(b)	Provides comparison with results from scales		1 mark
12	Instrument / scale has a false zero	No mark for simply stating that a zero error is a type of systematic error	1 mark

