

GCSE Science – Investigative Skills Assignment – Marking Guidelines

Biology 1.2 – Reaction Times

For submission in May 2007 or May 2008

Please mark in red ink, and use one tick for one mark.

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.

SECTION 1

1	First (independent) variable correctly identified eg person tested / drop height	1 mark
	Second (dependent) variable correctly identified eg time taken to react, length of ruler falling before being caught NB The link between the two must be evident to be awarded both marks	1 mark
2(a)	Identification of a control variable	1 mark
(b)	Description of how the variable mentioned above was controlled	1 mark
(c)	Any idea of making it a fair test explained or sensible reason for control explained The answer needs to be an explanation, and not just a statement that the results would be affected and not just 'to make it a fair test'	1 mark
3(a)	Correct range of independent variable stated, from smallest value to largest value	1 mark
(b)	Compare results with other groups or repeat the measurements with another student doing the testing or use another instrument or check against textbook results for the same reaction or get other people to repeat measurements	1 mark

(c)	Idea of how close the results are to the mean, eg include an example to illustrate why they are or why they are not precise or allow answer related to smallest scale division on measuring instrument	1 mark
4	Amplified correct statement eg boys are slower than girls Simple correct statement eg boys reaction times are different from girls for 1 mark only	2 marks
5	No mark for YES or NO Mark is for an appropriate explanation Amplified correct statement matching their confidence to the accuracy of the data Simple correct statement for 1 mark only eg YES – gives numerical example, eg all results within $\pm 10\%$ of mean for 2 marks states that results are closely clustered for 1 mark only or NO – refers to specific examples for 2 marks refers to the wide variation in the results for 1 mark only	2 marks
6	Table: Suitable table of results with all relevant data included Columns and rows correctly labelled with quantities and units	1 mark 1 mark
	Graph/chart: X axis: suitable scales chosen and labelled with quantity and units (no mark if bars are not the same width) Y axis: suitable scales chosen and labelled with quantity and units Points or bars plotted correctly to within $\pm 1\text{mm}$ Allow one plotting error Suitable line drawn on graph or bars correctly labelled on bar chart (allow error carried forward from incorrect plots)	1 mark 1 mark 1 mark 1 mark

Max 18 marks

SECTION 2

7(a)	Units for the strength of response	1 mark
(b)	0.1	1 mark
(c)	Precise	1 mark
8	Increasing the strength of the stimulus increases the strength of the response	1 mark
	up to a strength of 2.6	1 mark
	when it then decreases the strength of the response	1 mark

9	Person A has a higher strength of response	1 mark
	Person A peaks at a lower strength of stimulus than person B (converse answers acceptable)	1 mark
10(a)	Idea of controls or ensuring validity or fair comparison Do not accept just ‘to make it a fair test’	1 mark
(b)	So that the subject cannot anticipate the stimulus	1 mark
11(a)	Several astronauts Any two from: <ul style="list-style-type: none"> • tested before leaving Earth • then at regular intervals during space flight • then on return to Earth 	1 mark 2 marks
	Quality of written communication The mark is to be awarded for the correct sequencing of these ideas Annotate below candidate’s answer with <i>Q✓</i> for mark given or <i>QX</i> for mark not given.	1 mark
(b)	Any plausible answer that indicates an understanding of the safety derived from the ability to respond rapidly to changing situations in the context of space flight. Detailed explanation Simple explanation for 1 mark only eg Astronauts need to be able to react quickly to situations for 1 mark plus when arriving at a planet they will need to be able to balance for 2 marks	2 marks

Max 16 marks

ISA Total 34 Marks