

## Commentary on candidate 5 evidence (Simple Pendulum)

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

Section	Expected response	Maximum mark	Mark awarded	Commentary
1 Aim	An aim that describes clearly the purpose of the investigation.	1	0	The candidate's aim is not appropriate for a Higher Physics assignment. At the outset of the investigation, the teacher/lecturer must agree the topic with the candidate and provide advice on the suitability of the candidate's aim.
2 Underlying physics	An account of physics relevant to the aim of the investigation.	3	1	<p>The physics underlying this investigation is at a level above Higher.</p> <p>The candidate's description consists mainly of verbatim extracts from two sources, which does not demonstrate any understanding. This is compounded by the incorrect definition of period as <i>'the time it takes to swing from one position and get back to that position'</i>.</p> <p>The candidate, however, has correctly interpreted the extract and so has shown a limited understanding of the relevant physics.</p>

Section	Expected response	Maximum mark	Mark awarded	Commentary
3a Brief summary	A brief summary of the approach(es) used to collect experimental data.	1	1	The candidate has briefly summarised what they are measuring in both experiments and has indicated the measuring instruments used. Either summary would be sufficient to be awarded the mark in this section.
3b Sufficient raw data	Sufficient raw data from the candidate's experiment.	1	1	The candidate has made repeated measurements of period, producing five data points. The range of length is limited, but is acceptable.
3c Data table	Data, including any mean and/or derived values, presented in correctly produced table(s).	1	1	The candidate has presented the data from each experiment in tables with mean and derived values (for experiment 1) calculated correctly. The headings and units in both tables are correct.
3d Relevant data	Data relevant to the experiment from an internet/literature source or data relevant to the aim of the investigation from a second experiment.	1	1	<p>The candidate has included data from a second experiment which is relevant to the aim of the investigation.</p> <p>The candidate has made repeated measurements of period, producing five data points. Again, the range of mass is limited, but just acceptable.</p>

Section	Expected response	Maximum mark	Mark awarded	Commentary
3e Citation and reference	A citation and reference for a source of internet/literature data or information.	1	1	The sources of the internet extracts have been correctly referenced at the end of the report, and cited in the report.
4a Axes scaled	The axes of the graph have suitable scales.	1	1	The axes of both of the candidate's graphs have suitable linear scales.
4b Axes labels	The axes of the graph have suitable labels and units.	1	1	The axes of both of the candidate's graphs have suitable labels and units.
4c Accurately plotted data points and line of best fit	Accurately plotted data points and, where appropriate, a line of best fit.	1	1	<p>The candidate has accurately plotted all data points on both graphs.</p> <p>The line of best fit in the first graph is 'forced' to pass through the origin. This is not acceptable.</p> <p>The line of best fit for the second graph is acceptable.</p> <p>In section 4, the candidate is awarded the mark associated with the better graph (first graph: 2 marks; second graph: 3 marks).</p>

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5    Uncertainties	Scale reading uncertainties and random uncertainties.	2	1	The candidate has stated the scale reading uncertainty in the instruments used to measure period and length. The candidate has correctly calculated the random uncertainties in values of <i>time for 10 swings</i> , which is at variance with the corresponding headings in both tables.
6    Analysis	Analysis of experimental data.	1	0	The calculation of mean and derived values is not part of the analysis section.  The candidate has calculated the gradient of the line of best fit from both graphs, but has not included a unit, or discussed their physical significance.  This falls just short of an acceptable analysis at this level.
7    Conclusion	A valid conclusion that relates to the aim and is supported by all the data in the report.	1	0	The candidate has made a conclusion that is not supported by the data in the report. (Data shows a slight variation of period with mass.)

Section		Expected response	Maximum mark	Mark awarded	Commentary
8	Evaluation	Evaluation of the investigation.	3	2	<p>The candidate has made two evaluative statements.</p> <p>The first explains the benefit of timing 10 periods, rather than one. The candidate has identified a factor and described how it was improved.</p> <p>The second statement acknowledges poor experimental practice, and suggests how that could be addressed. Despite the systematic uncertainty (that would result from this poor practice) not being apparent in the intercepts of the lines of best fit, it is a valid evaluative statement for this investigation.</p>
9	Structure	A clear and concise report with an informative title.	1	0	The candidate's report is clear and concise, but does not have an informative title.
<b>Total</b>			<b>20</b>	<b>12</b>	