

Internal Assessment Coversheet

Student Name:	Session:	Candidate Number:
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Investigation title:

	Criteria					Total	%
	Personal engagement	Exploration	Analysis	Evaluation	Communication		
Mark given							
Available	2	6	6	6	4	24	100

n.b. Marks are given on a best-fit approach based on the levels awarded for each aspect of a given criteria. Refer to the criteria pages for a more detailed breakdown.

Candidate declaration	<i>"I confirm that this work is my own work and is the final version. I have acknowledged each use of the words or ideas of another person, whether written, oral or visual."</i>
Signed:	Date:

P e r s o n a l e n g a g e m e n t

This criterion assesses the extent to which the student engages with the exploration and makes it their own. Personal engagement may be recognized in different attributes and skills. These could include addressing personal interests or showing evidence of independent thinking, creativity or initiative in the designing, implementation or presentation of the investigation.

Mark	Aspect					
	Exploration		Personal significance		Initiative	
0	The student's report does not reach a standard described by the descriptors below.					
1	The evidence of personal engagement with the exploration is limited with little independent thinking, initiative or insight.		The justification given for choosing the research question and/or the topic under investigation does not demonstrate personal significance, interest or curiosity.		There is little evidence of personal input and initiative in the designing, implementation or presentation of the investigation.	
2	The evidence of personal engagement with the exploration is clear with significant independent thinking, initiative or insight.		The justification given for choosing the research question and/or the topic under investigation demonstrates personal significance, interest or curiosity.		There is evidence of personal input and initiative in the designing, implementation or presentation of the investigation.	
Checklist	P1.1	Arguments and discussion show intelligent use of citations, not reliance on them.	P2.1	RQ of question is based on prior research, but does not repeat it.	P3.1	Novel or innovative approach to address the research question
	P1.2	Arguments consider data, published data and observations together, not as separate entities.	P2.2	RQ based on personal interests	P3.2	Method uses known protocols, but adapts them to the investigation with good reason.
	P1.3	The discussion uses theory/citations beyond the research question to explain anomalies and trends, if necessary and relevant.	P2.3	RQ is relevant to local issues.		
			P2.4	RQ is novel and/or unusual.		
<i>n.b. Unlike other criteria personal engagement there just has to be point of evidence against an aspect, it does not have to comprehensively meet all mark points.</i>						

Exploration

This criterion assesses the extent to which the student establishes the scientific context for the work, states a clear and focused research question and uses concepts and techniques appropriate to the Diploma Programme level. Where appropriate, this criterion also assesses awareness of safety, environmental, and ethical considerations.

Mark	Aspect							
	Research question	Background	Method	Safety, ethics and environmental issues				
0	The student's report does not reach a standard described by the descriptors below.							
1	The topic of the investigation is identified and a research question of some relevance is stated but it is not focused .	The background information provided for the investigation is superficial or of limited relevance and does not aid the understanding of the context of the investigation.	The methodology of the investigation is only appropriate to address the research question to a very limited extent since it takes into consideration few of the significant factors that may influence the relevance, reliability and sufficiency of the collected data.	The report shows evidence of limited awareness of the significant safety , ethical or environmental issues that are relevant to the methodology of the investigation .				
2								
3	The topic of the investigation is identified and a relevant but not fully focused research question is described.	The background information provided for the investigation is mainly appropriate and relevant and aids the understanding of the context of the investigation.	The methodology of the investigation is mainly appropriate to address the research question but has limitations since it takes into consideration only some of the significant factors that may influence the relevance, reliability and sufficiency of the collected data.	The report shows evidence of some awareness of the significant safety , ethical or environmental issues that are relevant to the methodology of the investigation .				
4								
5	The topic of the investigation is identified and a relevant and fully focused research question is clearly described.	The background information provided for the investigation is entirely appropriate and relevant and enhances the understanding of the context of the investigation.	The methodology of the investigation is highly appropriate to address the research question because it takes into consideration all, or nearly all, of the significant factors that may influence the relevance, reliability and sufficiency of the collected data.	The report shows evidence of full awareness of the significant safety , ethical or environmental issues that are relevant to the methodology of the investigation .				
6								
Checklist	E1.1	Research Question is clearly stated.	E2.1	Reference to preliminary experiments, if relevant.	E3.1	IV correctly identified with units/range including an explanation of how this range was chosen.	E4.1	Safety issues fully considered.
	E1.2	The research question is a precisely formulated question.	E2.2	The background sets the research question into context.	E3.2	DV (as directly recorded) correctly identified with units.	E4.2	Ethical issues fully considered.
	E1.3	The research question can be used to formulate a hypothesis.	E2.3	Research question restated and referred to.	E3.3	Important control variables identified and presented as table.	E4.3	Environmental issues full considered.
			E2.4	Background biological theory described and explained.	E3.4	The likely impact of each control variable is discussed.		
			E2.5	Citations relevant to the research question used to support the biological theory.	E3.5	The potential impact of each control variable has been addressed.		
			E2.6	Demonstrated understanding of theory clarifies the context of the investigation.	E3.6	Method to manipulate IV fully detailed including units and uncertainty of tools (\pm _____)*		
			E2.7	Background information is used to form a hypothesis. Null and alternate hypothesis given if a statistical test of significance is to be used.	E3.7	Method for recording results, including units and uncertainty of tools (\pm _____)*		
			E2.8	If relevant a sketch graph is used to illustrate the hypothesis.	E3.8	List of apparatus including sizes and uncertainty*. Better add an annotated photo or diagram of equipment or experimental set-up.		
					E3.9	Specific method to keep each controlled variable constant has been explained clearly. This should include values and equipment used at each point in the method.		
					E3.10	Method is not generic, but is tailored to answer the RQ.		
					E3.11	Method clearly, specific and easily replicated by the reader, if desired.		
					E3.12	Full citation of published protocol, if used (or elements thereof)		
				* Uncertainties relate to published information, least count or reasoned judgement				

A n a l y s i s

This criterion assesses the extent to which the student’s report provides evidence that the student has selected, recorded, processed and **interpreted** the data in ways that are relevant to the research question and can support a conclusion.

Mark	Aspect									
	Raw data		Data processing			Impact of uncertainty			Interpretation of processed data	
0	The student’s report does not reach a standard described by the descriptors below.									
1	The report includes insufficient relevant raw data to support a valid conclusion to the research question.		Some basic data processing is carried out but is either too inaccurate or too insufficient to lead to a valid conclusion.			The report shows evidence of little consideration of the impact of measurement uncertainty on the analysis.			The processed data is incorrectly or insufficiently interpreted so that the conclusion is invalid or very incomplete.	
2										
3	The report includes relevant but incomplete quantitative and qualitative raw data that could support a simple or partially valid conclusion to the research question.		Appropriate and sufficient data processing is carried out that could lead to a broadly valid conclusion but there are significant inaccuracies and inconsistencies in the processing.			The report shows evidence of some consideration of the impact of measurement uncertainty on the analysis.			The processed data is interpreted so that a broadly valid but incomplete or limited conclusion to the research question can be deduced.	
4										
5	The report includes sufficient relevant quantitative and qualitative raw data that could support a detailed and valid conclusion to the research question.		Appropriate and sufficient data processing is carried out with the accuracy required to enable a conclusion to the research question to be drawn that is fully consistent with the experimental data.			The report shows evidence of full and appropriate consideration of the impact of measurement uncertainty on the analysis.			The processed data is correctly interpreted so that a completely valid and detailed conclusion to the research question can be deduced.	
6										
Checklist	A1.1	Data collected is relevant and appropriate to answer the RQ.	A2.1	Calculations to determine DV carried out, if necessary.	A3.1	Uncertainties adjusted/removed to reflect calculations carried out.	A4.1	Patterns and trends in data described with reference to the graph/ tables.		
	A1.2	Min. 5 increments (2 if comparing means) over a suitable range of the IV.	A2.2	Standard deviations included where appropriate (a minimum of 5 repeats is required for a valid calculation).	A3.3	Discussion of the size of the uncertainties compared to the data collected. Is the validity of the conclusion affected?	A4.2	Variation (e.g. std dev) within the data discussed.		
	A1.3	Min. 3 repeats, 5 repeats is recommended (or 15 if comparing means) at each increment to ensure reliability.	A2.3	Calculations or statistical tests appropriate to investigation and address RQ.	A3.4	Error bars included, unless insignificant.	A4.3	Anomalies identified and discussed.		
	A1.4	Insightful and thorough qualitative data (observations).	A2.4	Statistical tests include full details including null and alternative hypotheses, degrees of freedom, critical values and probability levels.	A3.5	Error bar source (e.g. standard deviation or min-max values) stated and correct.	A4.4	Patterns in the data related to the RQ.		
	A1.5	All data are recorded correctly and honestly.	A2.5	Mathematics correctly applied.			A4.5	Data points joined to illustrate the trend unless comparing means		
				A2.6	Formula (or excel equivalent) stated. Better worked examples of calculations given.					

Evaluation

This criterion assesses the extent to which the student’s report provides evidence of evaluation of the investigation and the results with regard to the research question and the accepted scientific context.

Mark	Aspect							
	Conclusion	Scientific context	Limitations of the data and sources of error	Suggestions for improvements and extension				
0	The student’s report does not reach a standard described by the descriptors below.							
1	A conclusion is outlined which is not relevant to the research question or is not supported by the data presented.	The conclusion makes superficial comparison to the accepted scientific context.	Strengths and weaknesses of the investigation, such as limitations of the data and sources of error, are outlined but are restricted to an account of the practical or procedural issues faced.	The student has outlined very few realistic and relevant suggestions for the improvement and extension of the investigation.				
2								
3	A conclusion is described which is relevant to the research question and supported by the data presented.	A conclusion is described which makes some relevant comparison to the accepted scientific context.	Strengths and weaknesses of the investigation, such as limitations of the data and sources of error, are described and provide evidence of some awareness of the methodological issues involved in establishing the conclusion.	The student has described some realistic and relevant suggestions for the improvement and extension of the investigation.				
4								
5	A detailed conclusion is described and justified which is entirely relevant to the research question and fully supported by the data presented.	A conclusion is correctly described and justified through relevant comparison to the accepted scientific context.	Strengths and weaknesses of the investigation, such as limitations of the data and sources of error, are discussed and provide evidence of a clear understanding of the methodological issues involved in establishing the conclusion.	The student has discussed realistic and relevant suggestions for the improvement and extension of the investigation.				
6								
Checklist	EV1.1	Possible impacts of qualitative data discussed.	EV2.1	Scientific explanation for results described.	EV3.1	Is the trend/pattern in the results clear or does random biological variation make it difficult to be certain about the trend (refer to error bars/std dev/strength of correlation)?	EV4.1	Improvements appropriate and related to the RQ/Hypothesis
	EV1.2	Conclusion based on, and refers to the interpretation of processed and raw data.	EV2.2	Scientific explanation justified with explicit reference to the data.	EV3.2	Does the range/increments of IV values produce data that enables the RQ to be answered?	EV4.2	Improvements are specific (e.g. equipment named) and clearly explained
	EV1.3	level of support (strong, weak, no support, or inconclusive) for the hypothesis/RQ is identified, correct and justified.	EV2.3	Comparison made with published data and theoretical texts	EV3.3	Analysis of sufficiency of data, is the way the DV is measured producing valid results or does it need to be changed?	EV4.3	Improvements, if related to published protocols or techniques, are cited correctly.
			EV2.4	Scientific context restated - does not rely on the background.	EV3.4	Systematic errors (problems with method), i.e. identified control variables, are discussed.	EV4.4	Addresses all the identified limitations of the data and sources of error.
					EV3.5	Impact of qualitative data on the validity of the conclusion examined.	EV4.5	Suggestions for further investigations are based on the conclusion and are relevant to the RQ

C o m m u n i c a t i o n

This criterion assesses whether the investigation is presented and reported in a way that supports effective communication of the focus, process and outcomes.

Mark awarded	Aspect							
	Presentation	Structure	Focus	Terminology and conventions				
0	The student's report does not reach a standard described by the descriptors below.							
1	The presentation of the investigation is unclear, making it difficult to understand the focus, process and outcomes.	The report is not well structured and is unclear: the necessary information on focus, process and outcomes is missing or is presented in an incoherent or disorganized way.	The understanding of the focus, process and outcomes of the investigation is obscured by the presence of inappropriate or irrelevant information.	There are many errors in the use of subject-specific terminology and conventions.				
2								
3	The presentation of the investigation is clear. Any errors do not hamper understanding of the focus, process and outcomes.	The report is well structured and clear: the necessary information on focus, process and outcomes is present and presented in a coherent way.	The report is relevant and concise thereby facilitating a ready understanding of the focus, process and outcomes of the investigation.	The use of subject-specific terminology and conventions is appropriate and correct. Any errors do not hamper understanding.				
4								
checklist	C1.4	A consistent linguistic style (preferably passive voice/third person) maintained throughout the essay.	C2.1	Obvious clear structure outlined, e.g. clear headings and titles	C3.1	All data and graphs are relevant to the RQ	C4.2	Table column headers present and correct (IV in the first column and DV values in subsequent columns)
	C1.5	Citations given for all support material taken from sources.	C2.2	Graphs, tables, and images titled, e.g. Graph #1 ...	C3.2	All images and media are relevant to the RQ	C4.3	Uncertainties correct (\pm ___)
	C1.6	Citations must use a clear consistent style and inline citations must be used to support the use of citations within text.	C2.3	Graphs, tables, and images included as close as possible to it's first reference/use.	C3.3	All citations included are relevant to the RQ	C4.4	Decimal points consistent with precision of the equipment / uncertainty
			C2.4	Tables & graphs do not break across pages	C3.4	All arguments and discussion are relevant to the RQ	C4.5	Decimal points consistent throughout (e.g. the precision of mean values is consistent with the data they are based upon)
			C2.5	Effective use of space leads to clarity of presentation	C3.5	Report consists of 6 to 12 pages	C4.6	Raw data clearly distinguished from processed data (possibly separate table)
			C2.6	Graphs clear, colouring appropriate			C4.7	Appropriate choice of graph
							C4.8	Graph axes labeled clearly
							C4.9	Graph axes scaled appropriately
							C4.10	Images annotated to give value to the investigation
							C4.11	Essay shows a mastery of, and fluency in, the use of appropriate scientific terminology.
							C4.12	Avoid excessive use of jargon.
							C4.13	Non-standard technical terms explained and used in the correct context (demonstrating understanding).