

Internal Assessment Codes for 2009

Design

Levels/ marks	Aspect 1	Aspect 2	Aspect 3
	Defining the problem and selecting variables	Controlling variables	Developing a method for collection of data
Complete 2	Formulates a focused problem/research question and identifies the relevant variables.	Designs a method for the effective control of the variables.	Develops a method that allows for the collection of sufficient relevant data.
Partial 1	Formulates a problem/research question that is incomplete or identifies only some relevant variables.	Designs a method that makes some attempt to control the variables.	Develops a method that allows for the collection of insufficient relevant data.
Not at all 0	Does not identify a problem/research question and does not identify any relevant variables.	Designs a method that does not control the variables.	Develops a method that does not allow for any relevant data to be collected.
	A1 No question or hypothesis or variables stated. A2 Question/hypothesis is too vague. A3 Question/hypothesis is incomplete. A4 This is a repeat of the general directions. A5 Answer to the question is obvious. A6 Question /Hypothesis is too simple for HS work. B1 The hypothesis needs an explanation. B2 The explanation is inadequate/wrong. B3 The hypothesis needs to be quantitative. B4 Don't make up your own explanation, cite a theory or authority, C1 Explain why this variable is relevant. C2 Is the variable quantitative and qualitative? C3 Identify the manipulated and responding variables. C4 Why does this variable need to be controlled? C5 Identify at least 3 variables to control. C6 This variable has no effect on system.	D1 Did not list the major apparatus. D2 Size and graduations needed. D3 Manufacturer needed. D4 This equipment is not available. D5 Diagram expected. D6 Diagram inadequate. D7 List chemicals and concentration. D8 Do not list uncertainties of apparatus. E1 No method (procedure) provided. E2 Some control variables are not addressed. E3 Procedure needs to be in numbered steps. E4 Not enough detail to follow instructions. E5 Do not detail common procedures. E6 No description of how to control variables. E7 Method does not control the variable. E8 Describe how to vary the manipulated variable.	F1 Relevant data is not recorded. F2 Instructions are not clear. Record the temperature ← <i>Acceptable</i> Take the temperature. ← <i>Unacceptable</i> F3 Describe how/when to measure the manipulated and responding variables. F4 Not enough manipulated variable values. (5 minimum) F5 Inadequate repetition of measurements. F6 The level of uncertainty is inappropriate. F7 Method for measuring additional data unclear.

Data collection and processing

Levels marks	Aspect 1	Aspect 2	Aspect 3
	Recording raw data	Processing raw data	Presenting processed data
Complete 2	Records appropriate quantitative and associated qualitative raw data, including units and uncertainties where relevant.	Processes the quantitative raw data correctly.	Presents processed data appropriately and, where relevant, includes errors and uncertainties.
Partial 1	Records appropriate quantitative and associated qualitative raw data, but with some mistakes or omissions.	Processes quantitative raw data, but with some mistakes and/or omissions.	Presents processed data appropriately, but with some mistakes and/or omissions.
Not at all 0	Does not record any appropriate quantitative raw data or raw data is incomprehensible.	No processing of quantitative raw data is carried out or major mistakes are made in processing.	Presents processed data inappropriately or incomprehensibly.
	G1 Raw data is incomplete. G2 Missing units! G3 Uncertainties not shown. G4 Inconsistent/wrong significant figures. G5 Incorrect precision or incorrect uncertainty. G6 No qualitative observations. G7 Initial/final readings missing. G8 Tare notification missing. G9 Processed data mixed with raw data. G10 Observations are inadequate, G11 Observations per trial expected.	I1 Sample calculations missing I2 Show all steps of sample calculation. I3 Sample calculations needs explaining. I4 Significant figures used incorrectly. I5 Repeated trials need averaged results. I6 Raw data was averaged. I7 Use final results for calc of uncertainty I8 Processed data needs calculated uncertainty. I9 Processed data needs estimated uncertainty. I10 Units missing. I11 Calculate % errors I12 Data processed incorrectly.	J1 Not easy to follow & understand J2 Not comprehensive/appropriate J3 Summarize results in a table J4 Graphs would have been useful J5 Title, axis, std notation missing J6 Appropriate size not used (Large is better) J7 Appropriate scale not used. J8 Did not show points and best line/curve. J9 Pathway to final result is hard to follow.

Data collection and processing (Cont.)

Levels marks	Aspect 1		Aspect 2		Aspect 3	
	Recording raw data		Processing raw data		Presenting processed data	
	H1	Did not use tables.			J10	The quality of the layout needs improvement.
	H2	Table was not labeled adequately/or missing.			J11	Incorrect choice of presentation (graph/ table)
	H3	Table title missing			J12	Tables/drawing/graphs not done correctly.
	H4	Table title inadequate			J13	Clear titles/labels missing
	H5	Tables messy/hard to read.			J14	Use tables and graphs to identify/clarify trends.
	H6	Table organization needs improvement.			J15	Analysis interpreting tables/graph needed.
	H7	Inappropriate data grouped in table.				
	H8	Manipulated variable should be in left column.				

Conclusion and evaluation

Levels marks	Aspect 1		Aspect 2		Aspect 3	
	Concluding		Evaluating procedure(s)		Improving the investigation	
Complete 2	States a conclusion, with justification, based on a reasonable interpretation of the data.		Evaluates weaknesses and limitations.		Suggests realistic improvements in respect of identified weaknesses and limitations.	
Partial 1	States a conclusion based on a reasonable interpretation of the data.		Identifies some weaknesses and limitations, but the evaluation is weak or missing.		Suggests only superficial improvements.	
Not at all 0	States no conclusion or the conclusion is based on an unreasonable interpretation of the data.		Identifies irrelevant weaknesses and limitations.		Suggests unrealistic improvements.	
	K1	No conclusion drawn	L1	No evaluation attempted	M1	No suggest improvements
	K2	Draw conclusion – don't restate results.	L2	Address the limitations of this conclusion.	M2	Tell what you would differently.
	K3	Conclusion was not related to purpose.	L3	Explain why test was inconclusive.	M3	Be specific "Be more careful" is unacceptable
	K4	Explain how conclusion follows from results.	L4	Magnitude of uncertainty a factor.	M4	Be realistic
	K5	Compare with lit. or accepted values. How do results compare to theory?	L5	Address limitations of procedure	M5	Don't suggest unavailable equipment
	K6	Discuss % error.	L6	Explain why this procedure is flawed.	M6	Don't suggest unavailable materials
	K7	Does the theoretical value fall in the random error range?	L7	Important variables not controlled.	M7	Suggestion does not reduce errors.
	K8	If values fall outside random error range identify systematic errors.	L8	Explain why this measurement is unreliable.	M8	Suggestion does not improve control of variables.
	K8	Misinterpretation of data led to wrong conclusion.	L9	Limitations due to lack of repetitions.	M9	Suggestion does not provide procedures for better measurements.
	K9	Conclusion does match data.	L10	Inappropriate equipment was used.	M10	If proper procedure is used then state that modifications are unnecessary or impossible.
	K10	Explain this statement.	L11	Time management issue is not convincing.	M11	Suggested improvements are superficial or do not result in better measurements.
	K11	Cite results to support this statement.	L12	Sources of systematic errors not discussed.	M12	Suggestions change purpose of experiment.
	K12	Conclusion is too simplistic.	L13	Explain how errors would affect results (magnitude & direction)	M13	Relate changes to limitations of the method.
	K13	Determine mathematical relationship.	L14	Compare error w/ results		
			L15	Explain why you believe conclusion is wrong.		
			L16	Missed some obvious limitations.		
			L17	Argument that you used proper procedure is not convincing.		
			L18	Partners are not sources of error. Focus on technique.		

Manipulative skills (assessed summatively)

Level /marks	Aspect 1	Aspect 2	Aspect 3
	Following instructions*	Carrying out techniques	Working safely
Complete 2	Follows instructions accurately, adapting to new circumstances (seeking assistance when required).	Competent and methodical in the use of a range of techniques and equipment.	Pays attention to safety issues.
Partial 1	Follows instructions but requires assistance.	Usually competent and methodical in the use of a range of techniques and equipment.	Usually pays attention to safety issues.
Not at all 0	Rarely follows instructions or requires constant supervision.	Rarely competent and methodical in the use of a range of techniques and equipment.	Rarely pays attention to safety issues.