OCR

RECOGNISING ACHIEVEMENT

TWENTY FIRST CENTURY SCIENCE

Science A
A219

and

Biology (A229), Chemistry (A329) & Physics (A339)

Advisory Guidelines for marking of Case Studies and Data Analyses

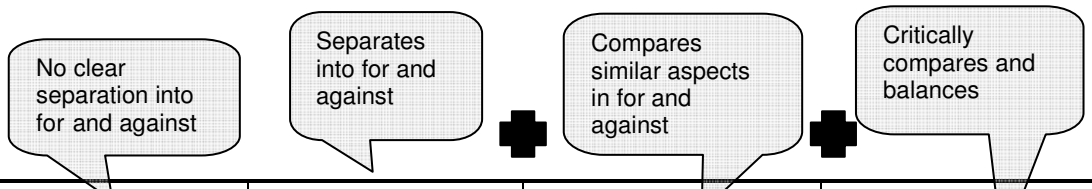
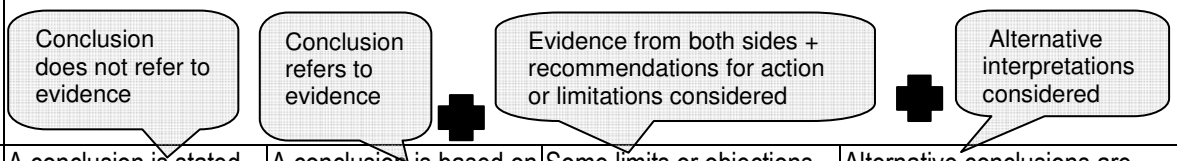
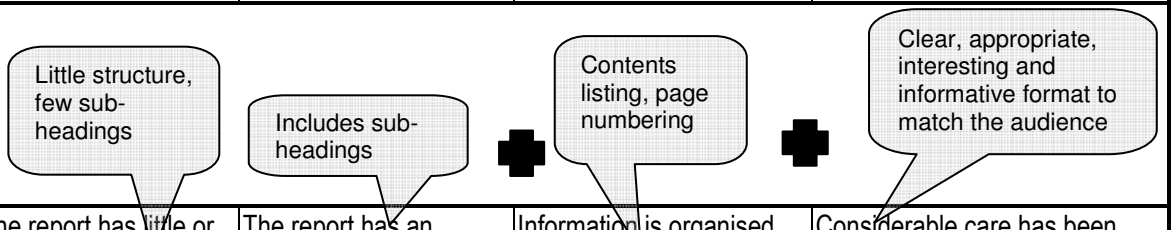
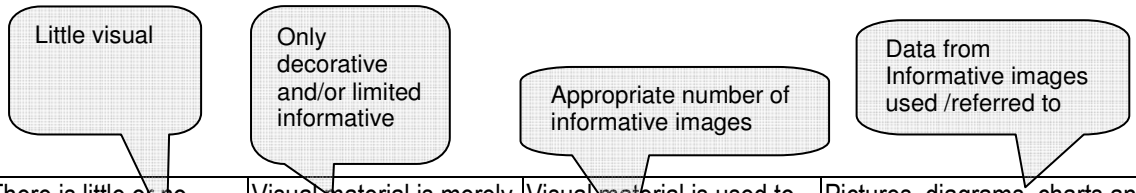
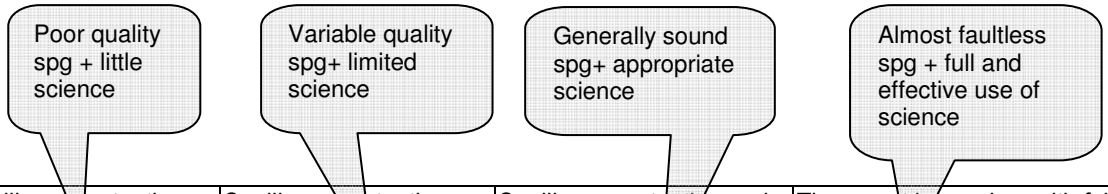
Skills Assessment

TWENTY FIRST CENTURY science

Marking Criteria and Key features for Case-Studies

A	1 mark	2 marks	3 marks	4 marks
	One source found by candidate. or only stimulus used	Limited sources	Sufficient sources selected to provide relevant info. 'for' and 'against'	Sources assessed for reliability e.g. status of author, peer reviewed journal
(a) Planning the use of sources of information	Very little information is given beyond that provided by the original stimulus material.	Information from a limited range of additional sources is included, although some may be irrelevant or inappropriate to the study.	Relevant information is selected from a variety of sources.	Sources of information are assessed for reliability as a basis for selection of relevant information from a wide variety of sources.
	One reference only	E.g. web homepages	Full urls	Full urls + background detail
(b) Acknowledgement of sources used.		Sources are identified by incomplete or inadequate references.	References to sources are clear, but limited in detail.	References to these sources are clear and fully detailed.
	One quote is identified			Quotations, opinions linked to sources
(c) Linking information to specific sources	-	Direct quotations are rarely indicated as such.	Direct quotations are generally acknowledged.	The sources of particular opinions are indicated at appropriate points in the text of the report.

B	2 marks	4 marks	6 marks	8 marks
	Science (diagram or text) cut-and-pasted without comment	E grade science	C grade science	A grade science and linked to views
(a) Making use of science explanations	Only superficial mentions of science explanations, often not correctly applied to the case	Provides a basic outline of the main scientific ideas which are relevant to the case.	Provides a detailed review of the scientific knowledge needed to understand the issues studied.	Considers how different views described in the study can be supported by detailed scientific explanations.
	Only unsupported claims quoted	Science content recognised in sources	Evidence/data used to support claims	Data evaluated e.g. sample size, repeat studies
(b) Recognition and evaluation of scientific evidence.	Sources are uncritically quoted without distinguishing between scientific evidence and unsupported claims.	Science content and data in sources is recognised.	Claims and opinions are linked to the scientific evidence they are based on.	The quality of scientific evidence in sources is evaluated in relation to the reliability of any claims made.

C	2 marks	4 marks	6 marks	8 marks
				
(a) Comparing opposing evidence and views	Information is unselectively reported without taking any clear view about any course of action.	Claims for a particular idea, development or course of action are reported without critical comment.	Claims and arguments for and against are reported, but with little attempt to compare or evaluate them.	Details of opposing views are evaluated and critically compared.
				
(b) Conclusions and recommendations	A conclusion is stated without reference to supporting evidence.	A conclusion is based on evidence for one view only.	Some limits or objections to the conclusion are acknowledged.	Alternative conclusions are considered, showing awareness that different interpretations of evidence may be possible.
D	**1 mark**	**2 marks**	**3 marks**	**4 marks**
				
(a) Structure and organisation of the report	The report has little or no structure or coherence, or follows a pattern provided by worksheets.	The report has an appropriate sequence or structure.	Information is organised for effective communication of ideas, with contents listing, page numbering etc as appropriate to aid location of key elements.	Considerable care has been taken to match presentation and format to present issues and conclusions clearly and effectively to a chosen audience.
				
(b) Use of visual means of communication	There is little or no visual material (charts, graphs, pictures, etc) to support the text.	Visual material is merely decorative, rather than informative.	Visual material is used to convey information or illustrate concepts.	Pictures, diagrams, charts and or tables are used appropriately and effectively to convey information or illustrate concepts
				
(c) Spelling, punctuation and grammar	Spelling, punctuation and grammar are of generally poor quality, with little or no use of appropriate technical or scientific vocabulary.	Spelling, punctuation and grammar are of variable quality, with limited use of appropriate technical or scientific vocabulary.	Spelling, punctuation and grammar are generally sound, with adequate use of appropriate technical or scientific vocabulary.	The report is concise, with full and effective use of relevant scientific terminology. Spelling, punctuation and grammar are almost faultless.

TWENTY FIRST CENTURY science

Marking Criteria and Key features for Data Analyses

	Displays limited results after help given	Bar charts or significant errors in graphs	6: Correctly scaled and labelled axes; correctly plotted points; good quality lobf 5: poor quality aspects or dot-to-dot	In addition to 6 range bars or draws scatter graph
I(a)	Display limited numbers of results in tables, charts or graphs, using given axes and scales.	Construct simple charts or graphs to display data in an appropriate way, allowing some errors in scaling or plotting.	Correctly select scales and axes and plot data for a graph, including an appropriate line (normally a line of best fit) or construct complex charts or diagrams (e.g. stacked histo-grams, species distribution maps).	Additionally, indicate the spread of data (e.g. through scatter-graphs or error bars) and give clear keys for displays involving multiple data-sets.
	Select individual results as a basis for conclusions.	Carry out simple calculations e.g. correct calculation of averages from repeated readings.	Use mathematical comparisons between results to support a conclusion	Use complex processing to reveal patterns in the data e.g. statistical methods, use of inverse relationships, or calculation of gradient of graphs.
	Compares individual results	Calculates averages or changes in e.g. mass	uses results in formulae/equations	further processing to find patterns
	Notes differences	Qualititative trend	Quantitative trend	Takes into account the scatter in the data
I(b)	Note differences between situations/cases, or compares individual results.	Identify trends or general correlations in the data	Describe formal or statistical relationships within the cases/situations studied	Review the extent of, or limitations to, formal conclusions in relation to the scatter evident in the data.
	No relevant science	explains trend/conclusion using some scientific ideas	C grade SKU	A grade SKU
I(c)	Link the outcomes to previous experience or 'common sense'.	Relate the conclusion to scientific ideas/explanations.	Justify the conclusion by reference to relevant scientific knowledge and understanding.	Use detailed scientific knowledge to explain all aspects of the given conclusion.
	Comments on method of data collection	Identifies problems in method related to accuracy or range	Appropriate Improvements to method outlined	More detail + justification
E(a)	Make a relevant comment about how the data was collected and safety procedures	Comment on the limitations to accuracy or range of data imposed by the techniques and equipment, used.	Suggests improvements to apparatus or techniques, or alternative ways to collect the data, but without sufficient practical detail.	Describe in detail improvements to the apparatus or techniques, or alternative ways to collect the data, and explain why they would be an improvement.
	Comments on accuracy but no reference to data	Notes presence or absence of outlier(s)	Relates reliability to scatter in repeats + scatter around lobf	More detail + accounts for anomalies
E(b)	Make a claim for accuracy or reliability, but without appropriate reference to the data.	Note the presence or absence of results that are beyond the range of experimental error.	Use the general pattern of results or degree or scatter between repeats as a basis for assessing accuracy and reliability.	Consider critically the reliability of the evidence, accounting for any anomalies.
	Confidence level in conclusion linked to	technique and data	precision of apparatus, range covered, reliability of data	weaknesses in data and need to collect further data and/or refer to other sources
E(c)	Relate judgement of the reliability (or otherwise) of the conclusions only to techniques used, not to data collected.	Link confidence in the conclusion to the apparent reliability of the data collected.	Discuss the precision of apparatus and techniques, the range covered and reliability of data to establish a level of confidence in the conclusions.	Identify weaknesses in the data and give a detailed explanation of what further data would help to make the conclusions more secure.