

B. Evaluation

Candidates should be able to:

- Identify anomalous values in provided data and suggest appropriate means of dealing with such anomalies
- Within familiar contexts, suggest possible explanations for anomalous readings;
- Identify the extent to which provided readings have been adequately replicated, and describe the adequacy of the range of data provided;
- Use provided information to assess the extent to which selected variables have been effectively controlled;
- Use these evaluations and provided information to make informed judgements on the confidence with which conclusions may be drawn;

In a table or graph of data, candidates should be able to **identify values which are clearly anomalous**, and suggest **strategies** for dealing with such anomalies, including repeating the experiment or omitting the affected replicate.

Where investigations are set in familiar contexts, that it is expected that candidates will have explored during the course (those marked * in the syllabus content), candidates may be asked to suggest possible causes for such anomalies (above and beyond 'investigator error'), and will be rewarded for answers derived from their own experience of problems intrinsic in the particular investigation.

Candidates will be expected to have a knowledge of the **advantages of replication of data**, and the **practical limitations**. Candidates will be expected to be able to identify instances where it would have been sensible for the investigator to take readings at lower or higher values of the independent variable in order to give a complete range of values, and also situations where there are gaps in the range that reduce the information that can be provided from the investigation (e.g. around a key turning point).

Candidates may be provided with information that will permit them to assess the extent to which a particular variable have been effectively controlled (e.g. the temperature recorded within each of a number of samples in which it is supposed to be the same).

Candidates should be able to draw together all of this information to make informed judgements about the reliability of the investigation and the confidence with which the hypothesis may be tested.

C. Conclusions

Candidates should be able to:

- draw conclusions from an investigation, providing a detailed description of the key features of the data and analyses, and considering whether experimental data supports a given hypothesis;
- make detailed scientific explanations of the data and of their conclusions, drawing on the skill, knowledge and understanding that they have gained from their studies of the AS and A2 syllabus;
- make further predictions, ask informed and relevant questions and
- suggest improvements;

Key points of the raw data, graphical representations of it and statistical test results should be given, including quoting of relevant figures, leading to a clear indication of the strength or weakness of any support for or against the hypothesis, or indeed, its proof or refutation.

Detailed scientific explanations form a part of such conclusions and therefore form a part of this higher-order practical skill assessment. Candidates will be expected to refer to knowledge and understanding gained in their theory part of the course.

Where appropriate, candidates may be given the opportunity to ask questions based on their conclusions and thus to derive further predictions and hypotheses. Within familiar contexts and in relation to the evaluations they have made, candidates may be offered the opportunity to suggest how the investigation may be improved in order to increase the confidence in drawing conclusions.