

**IA accounts for 24% of the marks, one IA total marks is 18.**

<b>Design</b>			
	<b>ASPECTS</b>		
<b>Levels/Marks</b>	<b>Defining the problem and selecting variables</b>	<b>Controlling variables</b>	<b>Developing a method for collection of data</b>
<b>Complete/2</b>	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.
<b>Partial/1</b>	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.
<b>Not at all/0</b>	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

### **Design – In my lab report, I have...**

1. Framed a detailed and focused research question (includes the IV, DV and mentions CV), with scientific name of the specimen used.
2. Formulated a hypothesis- Prediction is supported with relevant source
3. Listed independent, dependent, and controlled variables (with units and ranges where appropriate)
4. Explained how the controlled variables listed as the variables above will be controlled and why it needs to be controlled
5. Described the procedure such that it could be repeated by someone reading my instructions
6. Described in the procedure how I will change the independent variable
7. Explained in the procedure how the dependent variable will be measured
8. Ensured that I have enough data points (have changed the independent variable a significant number of times, generally at least 5)
9. Suggested sufficient repetitions (generally 5)
10. A brief explanation of how the data will be processed.
11. An annotated picture of the experimental setup.

Data Collection and Processing			
ASPECTS			
Levels/Marks	Recording raw data	Processing raw data	Presenting processed data
<b>Complete/2</b>	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.
<b>Partial/1</b>	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.
<b>Not at all/0</b>	Does not record any appropriate quantitative raw data <b>or</b> raw data is incomprehensible	No processing of quantitative raw data is carried out <b>or</b> major mistakes are made in processing.	Presents processed data inappropriately <b>or</b> incomprehensibly.

### DCP – In my lab report, I have...

1. Included all the raw data, qualitative and quantitative where appropriate.
2. Included uncertainties on all measured variables
3. Included all units and ensured units of measurement and uncertainties are the same
4. Used consistent decimal places in each column of data and consistent with the uncertainty
5. Displayed my data in a table
6. Included titles for my tables that describe their contents
7. Organized my table in a way that is easy to read, with detailed column headings
8. Calculated averages, reaction rates, % changes, standard deviation, and correlations where necessary
9. Displayed my processed data in an organized table, complete with title and units
10. Ensured that my significant figures are no greater than the lowest number of significant figure in the raw data used to in the processing of that data
11. Included sample calculations below the table
12. Calculated any percentage errors (compared to published values) that are required
13. Graphed my PROCESSED data if it is appropriate to do so (don't graph raw data unless you can use it for further processing, ie slope of line to get reaction rate)
14. Chosen the correct type of graph (scatter plot, bar, histogram, etc)
15. Put error bars on the graph that represent either max/min values or +/- standard deviation, standard error if there are enough samples per condition (usually a minimum of 5)
16. Ensured my graph has a title, axis labels (with units), and scales that are appropriate
17. Drawn a line of best fit (trendline) where appropriate DO NOT JOIN THE DOTS.

Conclusion and Evaluation			
	ASPECTS		
Levels/marks	Drawing conclusions	Evaluating procedure(s)	Improving the investigation
<b>Complete/2</b>	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.
<b>Partial/1</b>	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
<b>Not at all/0</b>	States no conclusion <b>or</b> the conclusion is based on an unreasonable interpretation of the data.	Identifies irrelevant weaknesses and limitations	Suggests unrealistic improvements

### CE – In my lab report, I have...

1. Stated the RQ and the hypothesis.
2. Discussed the trends of the processed data, being specific where it is appropriate.
3. Related the data to the theory of the lab with references where appropriate.
4. Compared my data to given or accepted/theoretical values and analyze any differences
5. Listed weakness of the lab that would have led to inaccuracies in the data
6. Listed any assumptions that were key to the interpretation of the lab and discussed their limitations
7. Proposed changes to the lab procedure/equipment that address the listed weaknesses
8. Ensured that the suggested changes are specific, realistic, and able to be performed