

What is a Chemistry IA?

Welcome to your Chemistry IA. In the sciences, your IA takes the form of an “individual investigation”. The goal of this investigation is for you to demonstrate that you are able to:

- a. Research a topic from within the scope of your subject
- b. Ask a relevant question about that topic that can be answered by collecting and analyzing data in a well-designed experiment (or alternate form of data collection)
- c. Design the experiment (or process) you will use to collect your data
- d. Perform an experiment to collect the data you need
- e. Correctly interpret the results of that data analysis
- f. Use those interpreted results to answer your question
- g. Reflect on the whole process by QUANTIFYING the strengths and weaknesses in your data collection and processing methodologies and DISCUSSING the SPECIFIC impacts those strengths and weaknesses had on your results and how to redesign your methodology to address those weaknesses

You may have noticed that somewhere during the seven points listed above an experiment occurs. However, it is vitally important to stress that:

YOUR IA IS NOT ABOUT THE EXPERIMENT YOU PERFORM

Even though an experiment happens at some point during the investigation, your IA is not about that experiment. It is about your skill at using an experiment to answer a well-researched and testable question, and your ability to reflect on the process and identify exactly WHAT went right (or wrong), evaluate WHY things went right (or wrong), and explain HOW the things that went right (or wrong) affected your results.

This focus on *the process* surrounding the experiment is reflected in the way your IA will be marked:

- | | |
|--|------|
| 1. Developing a “Research Question” | 8% |
| 2. Designing a process that collects high quality data | 9% |
| 3. Describing the process that you designed | 8% |
| 4. Performing proper analysis of collected data | 25% |
| a. <i>Sufficient data collection</i> | (4%) |
| b. <i>Data processing</i> | (4%) |
| c. <i>Correct use of uncertainty</i> | (8%) |
| d. <i>Interpreting your results</i> | (9%) |
| 5. Answering the “Research Question” with your results | 13% |
| 6. Using external research to support your answer | 12% |
| 7. Reflecting on the design of your experiment | 12% |
| 8. Explaining different ways to do things better next time | 13% |

What a Chemistry IA?

Notice that performing the actual experiment barely factors into the mark you receive (4% of the total mark). The vast majority of your mark comes from the processes that lead up to doing the experiment and the processes that come after the experiment has been completed.

This does not mean the topic/goal of the experiment you design is unimportant. You need to pick a topic that will allow you to design an experiment that...

- a. tests for a relationship between two variables (independent & dependent) while keeping all other potential variables constant (controlled)*
- b. collects sufficient raw data to support accurate and reliable results*
- c. shows evidence of awareness of and attempt to reduce sources of error and uncertainty*

You DO NOT GET MARKS FOR HAVING A COMPLICATED AND TIME CONSUMING EXPERIMENT. Instead, having a simple but well-designed experiment that collects sufficient useful and reliable data is essential for scoring well in the other aspects of your IA.

What does all this mean for you? It means that your focus during this IA process should be on

- 1. Developing a GOOD research question that is both related to a topic from the course and can be answered by looking for a relationship between two QUANTIFIABLE variables**
2. Designing an experimental procedure whose sole purpose is the collection of reliable data that can be used to answer that research question
3. Demonstrating the existence of a relationship (*or the lack of a relationship*) between your chosen variables and showing how that relationship (*or that lack of a relationship*) is an answer to your research question.
- 4. Reflecting on the process you designed and explaining what parts of that process made your results LESS reliable and the EXACT effect it had on your results. Then propose solutions that would address those design limitations and explain how your proposal would change the results.**
5. Making sure your IA follows the standard design and layout for an IB lab report, and you are communicating clearly (in English) with proper use of spelling, grammar, terminology, and specific scientific conventions.