

Chemistry Internal Assessment

Criteria:

- Choose an area for investigation (within the HL Chemistry curriculum) with valid personal engagement to the topic (ensure that optional units relate back to the core content)
- Develop a focused research question and design an experiment to answer the question
- Collect data that enables you to answer the research question
- Write a formal lab report introducing your topic and experiment
 - Describe your experiment
 - Analyze your data
 - Drawing conclusion
- **MINIMUM: 20% GRADE FOR BOTH SEM 1 & 2**

Topic Approval:

- **75 Minutes** of class time over two days allotted to brainstorming/developing ideas (however, more time spent outside of school time is highly recommended)
- Have an open working document with your teacher (only one topic can be submitted for approval at a single time)
- Do not delete any conversation as to keep track of progress
- Your teacher must sign off on your topic before you can approve it (only teachers can approve topic)

- Topic reservation begins on **September 24th**, conversation with teacher can start immediately
- Deadline for topic reservation is **October 15th** for all selections.

Experimental Preparation and Data Collection:

- One day will be allocated to prepare (make solutions, learn to use any equipment)
- Four days to collect data (no time outside of class will be allocated)
- Extra time in class will only be given only in extenuating circumstances
 - Negotiated before the final experiment day
 - Any of the following experiences:
 - Validated Absence
 - "After starting to collect data, I realized that I needed to account for an extra variable that drastically affects the data"
 - Equipment difficulties/failure
- Classes will be divided into two groups (separate dates for each)
- Ensure that you are prepared when you come to class and be efficient during class time

Feedback:

- The report can be submitted to the teacher one time prior to final submission

- Ask 2-3 big questions (Ex. is my introduction chemistry focused enough, have I adequately explained my systematic errors correctly, do my graphs express my data clearly)
- Requests must be specific (not "is it ok")

Data Processing:

- The independent classwork time can be used to process the data and work on writing up the report
- It is recommended that you start working on key aspects of your report at the start
- Ask teacher supplemental questions about report writing (quick conversations)

Submission:

- The deadline for submission is **December 17th**
- Submit to Managebac (Turn-It-In)

Choosing a Topic:

- Thinking about a "big picture" or "application" for your investigation to have meaning
- Choose investigation that genuinely makes you feel personally engaged and to justify the topic
- Experiment and Investigation are not the same thing
 - Experiment is the physical process of data collection
 - Investigation is the report written about it

- Choose an experiment that is not being done in class and it is the student's responsibility to determine if the content will be taught in the course at a later date
- Keep the experiment simple as time in class to collect data is limited

Successful Investigation Design:

- Avoid research questions that are self-evident and/or repeat experiments that has already been done in class (IB/Academic)
- Consider the relevant types of variables and methods of data collection
- Develop a focused research question with appropriate and meaningful details (your questions should not "beg further questions")
- Itemize lists of equipment and materials (with quantities) and learn how to operate them
- Construct an efficient procedure to conduct the experiment
- **DO NOT PLAGARIZE** (even by accident)
 - Cite references as you go
 - Paraphrase
 - Keep draft copies of your report and show progress
- Poorly executed experiment will not generate a good report (do not neglect planning process)
 - Ensure that the variables testing can be determined experimentally
 - Sensitivity of equipment must be researched
- Do not leave work to the last minute (easier to start writing immediately)

- Pay attention to the "IA Report Suggestion" (content and format)
- Allow time to have someone else (who doesn't know what you did) to read the report
 - They cannot provide suggestions
 - Only question if something is not clear
- 5 variations in independent variables and at least 3 repeats for each value **(5 × 3)**

Database/Simulation Lab

- Students can choose to do a database or simulation lab
- Database Lab
 - Secondary data from publications
 - Ensure to use databases and not websites (official scientifically credible sources)
- Simulation Lab
 - Collect data from virtual experiments
 - Usually do not have uncertainty value associated with it
- For both labs, the **assessment standard will not be lowered** (ensure that the content is grade-appropriate) and perform rich data processing

Changes to Lab report

- ***Introduction:***
 - Outline what you are investigating, in the appropriate context

- Why you are conducting this investigation (broader purpose)

- ***Research Question:***

- Research question must be phrased in the form of a question
 - How does X variable affect Y
- Supported with clear variables

- ***Background Information:***

- Carefully review this section as many people did not construct good background information sections in the previous mock IA

- ***Methodology:***

- Rather than a number list of steps taken to conduct an experiment, write up a narrative (paragraph or set of paragraphs) to explain the decision making throughout the experiment
- Outline why certain variables are constant, and what and why variables are changed
- This section should be written in past tense not present/future and should not be written in first person tense

- ***Data Collection:***

- Have a well constructed, properly titled data collection table
- No equipment uncertainty in database labs
- Range of difference as uncertainty (can compare different databases)
- Be specific about where you searched for data and put links to the sites

- ***Data Processing:***

- Data should be quantifiable and lead to a clear conclusion
- Clear and appropriate calculations using raw data

- Present the processed data in clearly readable graphs
 - Scatterplot are better than bar graphs (some bar graphs might be produced by simulation labs) and are not ideal

- **Conclusion:**

- Relate back to the research question

- **Evaluation:**

- There are no systematic errors to record
- Discuss limitations with your data source/simulator
 - What characteristics, properties, details were you able to manipulate
 - Opportunity was available for effective control of relevant variables
 - Useful characteristics to control that you weren't able to control
- Do not discuss suggested improvements since there is no way to be successful at this
 - Explain how the limitations prevented you from getting more accurate/precise data