INTERNAL ASSESSMENT GUIDELINES

**Winston Churchill High School IB Sciences**

P

ractical lab work is an important part of the IB science curriculum. It is referred to as internal assessment because your classroom teacher is the one who is responsible for designing the lab program and assessing your lab work. The IB organization moderates the lab program to make sure you are carrying out suitable investigations and that your teacher is marking fairly and accurately. This handout provides the expectations for both biology and chemistry laboratory work in the IB program at Winston Churchill High School.

There are five assessment criteria used to assess practical work:

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| **Criterion** | **Aspects** |
| Design (D) | Defining the problem and selecting variables | Controlling variables | Developing a method for collection of data |
| Data collection and processing (DCP) | Recording raw data | Processing raw data | Presenting processed data |
| Conclusion and evaluation (CE) | Concluding | Evaluating procedure(s) | Improving the investigation |
| Manipulative Skills (MS) | Following instructions | Carrying out techniques | Working safely |
| Personal Skills (PS) | Self-motivation and perseverance | Working within a team | Self-reflection |

Only your two **highest** marks for each of the first three criteria will be submitted to IB at the end of your Grade 12 year. Though your teacher will continually be monitoring your work in the lab, you will only receive one mark for manipulative skills at the end of Grade 12. You will also only receive one mark for personal skills during your work on the Group 4 project.

Note:

While these criteria are used to assess all “full” labs (i.e., those you design and carry out on your own) your teacher may use additional and/or completely different criteria to assess other labs. For example you may be given a mark out of 5 when completing a graph. It is also possible to have labs where only one criterion is being assessed.

***D – Design***

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| 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. |

* Your teacher may provide you with a responding variable but you need to come up with an appropriate manipulated variable, specific research question, and controlled variables.
* It is important to design an investigation that will allow you to collect quantitative data.
* Background information is not always necessary but, if included, should be limited to discussing the variables in the investigation (i.e., supporting a hypothesis).
* Give accurate and concise details about the apparatus and materials used—a diagram may be helpful.
* Write in the past, passive tense. For example, “the solutions were mixed” instead of “we mixed the solutions” or “mix the solutions”.
* Explain how your procedure will control the variables listed.
* Include enough detail in your procedure that it could be repeated. It might be helpful to have another student in the class read over your procedure to see if it makes sense.
* If your textbook provides a method for a standard technique (eg. filtration) it is acceptable to include it in your procedure as long as you include a reference for it.
* Prepare your data table before you begin work in the lab.

***DCP – Data Collection and Processing***

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| Records appropriate quantitative and associated qualitative data, including units and uncertainties where relevant. | Processes the quantitative raw data correctly. | Presents processed data appropriately and, where relevant, includes errors and uncertainties. |

* You need to record all data/observations in ink while you are in the lab. It is NOT acceptable to record data in pencil or to recopy it. If you are working with a partner each of you must record your own set of data as you collect it.
* Record all measurements accurately to the correct number of significant figures and include all units.
* Be sure to record the precision of each piece of measuring equipment used.
* You will need to have at least five data points to obtain a meaningful best-fit line on a graph or to calculate standard deviation.
* Uncertainties must be propagated through to the final calculated result.

***CE – Conclusion and Evaluation***

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| 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. |

* State a valid conclusion that relates directly to your initial purpose or hypothesis.
* If there is an accepted literature value then you need to include a percent error calculation and a reference for the source (eg. data booklet).
* Discuss how your results are (or aren’t) in line with currently accepted theory.
* You need to comment on both random and systematic errors that may have affected your results.
* It is not sufficient to make a list of possible errors. You need to evaluate their impact on your results—too high, too low, small, large, due to equipment or procedure, etc.
* “Being more careful next time” is not a specific enough improvement!

***MS – Manipulative Skills***

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| Follows instructions accurately, adapting to new circumstances (seeking assistance when required). | Competent and methodical in the use of a range of techniques and equipment. | Pays attention to safety issues. |

* Safety is the number one priority in the lab so while the goal is to have you become more independent, be sure to ask if you are unsure about anything!
* Follow proper disposal procedures for both chemical waste and biological specimens.

***PS – Personal Skills***

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| Approaches the project with self-motivation and follows it through to completion. | Collaborates and communicates in a group situation and integrates the views of others. | Shows a thorough awareness of their own strengths and weaknesses and gives thoughtful consideration to their learning experience. |

* This criterion will be discussed in more detail during preparations for the Group 4 project which is run every other year in mixed grade and subject groupings during the first week of February

FAQs

1. I’ve heard that IB labs are a lot of work, is this true?

**YES/NO**. Most of your lab work in Grades 10 and 11 is formative and you aren’t likely to complete a full lab on your own until Grade 12. Also, the focus of internal assessment in IB is working in the lab not writing a report. While your report is important you should always strive for quality, not quantity.

1. Do my labs need a title page?

**NO**. You do need to include the title of the investigation, your name, your lab partner’s name (if applicable), and the date on the first page of your report.

1. Do my labs have to be typed?

**NO**. Unless your writing is illegible or you type faster than you write, labs can be handwritten in blue or black ink.

1. Do I need to list my variables?

**YES**. If you want to get full marks you need to explicitly list your manipulated, responding, and controlled variables in the design section of your report.

1. Can I collect data using a data logger?

**YES**. The IB program has an ICT component that encourages the use of technology. However, it cannot be used to carry out a “cookie-cutter” experiment. You must set up the data collection and analysis parameters yourself. The school has Vernier’s LabQuest interface and sensors that can be used.

1. Do I need to show all my calculations?

**NO**. Summarizing your results is acceptable as long as you have shown an example calculation (i.e., for one trial only).

1. Can my lab partner and I hand in our report together?

**NO**. You can work together in the lab but you will each record your own data and complete the report on your own.

1. Do I need to include references?

**YES**. References are necessary for any sources you use. The APA format is recommended but you can use another format as long as you are consistent.

1. Do I need to keep all my labs?

**YES**. You will keep your labs in a binder that stays in the classroom.