**Holistic Rubric for Physics Lab Reports- Richmond Hill High School Science Department**

**Student Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**5+ -** Any report which exceeds the expectations of a rating of “5”

**5+-** Rating: All the components of the experiment-objectives, background information/research, hypothesis (where applicable), variables, procedure, results, observation, and conclusions-have been addressed and elaborated as set by expectations. Student has demonstrated a good understanding of the scientific process and has displayed the ability to properly use all scientific equipment safely. Student has demonstrated performance in a variety of process skills: observation, inference, prediction (where applicable), data collection and analysis, measurement, and communication and interpretation of results at a **proficient** level. The experiment and report were well organized and easy to follow and interpret. The report includes Title, Introduction, Materials and Methods, Results, and Discussion (and Reference, where necessary) section in this order and is written clearly with little or no deviation from the teacher-designated format. Grammar and spelling are sound, with few or no errors. There was clear evidence of the students’ knowledge and understanding of the scientific concepts and vocabulary addressed. The conclusions provide a clear explanation of the results, including whether the hypothesis (if applicable) should be supported or rejected. An analysis of systematic experimental sources of error-e.g., not random human errors or calculation mistakes-is given with suggestions for methods of reducing that error. Inferences have been drawn from the conclusion along with possible recommendations for new avenues of experimentation and/or real-life applications as a result of the experiment have been noted.

**4 –** Rating: All the components of the experiment-objectives, background information/research, hypothesis (where applicable), variables, procedure, results, observation, and conclusions-have been addressed and elaborated upon. Student has demonstrated a good understanding of the scientific process and has displayed the ability to use all scientific equipment safely. Student has demonstrates in a variety of process skills: observation, inference, prediction (where applicable), data collection and analysis, measurement and communication and interpretation of results at an **acceptable** level. The experiment and report were organized and easy to follow and interpret. The report includes Title, Introduction, Materials and Methods, Results, and Discussion sections and is written with few deviations from the teacher-designated format. The report was well organized and reasonably easy to follow and interpret. There was acceptable evidence of the student’s knowledge and understanding of the students’ knowledge and understanding of the scientific concepts and vocabulary addressed. Conclusions included a discussion of the hypothesis (if applicable) and reasonable explanation of the results, but the student failed to thoroughly address key aspects such as experimental error and recommendations for new avenues of experimentation and /or real life applications.

**3-** Rating: All the components of the experiment-objectives, background/research, hypothesis (where applicable), variables, results, observation, and conclusions-have been addressed, but very little elaboration is present. Student has demonstrated an understanding of the scientific skills, observation, inference, prediction (where applicable), data collection and analysis, measurement, and communication and interpretation of results at a **basic** level. The experiment/report was organized, but was somewhat difficult to interpret and follow. The report includes Title, Introduction, Materials and Methods, Results, and Discussion sections but deviates noticeably from the teacher-designated format. There was basic evidence of the students’ knowledge and understanding of these scientific concepts and vocabulary addressed. Conclusions provided an explanation of the results, but the student completely failed to address one or both of the following: experimental error and possible recommendations for new avenues of experimentation and /or real- life applications.

**2-** Rating: All but one of the components of the experiment-objectives background information/research, hypothesis (where applicable), variables, procedures, results, observation, and conclusions- have been addressed, but no elaboration is present. Student has demonstrated some understanding of the scientific process and has displayed some ability to use scientific equipment. Student has demonstrated performance in some of the process skills: observation, inference, prediction (where applicable), data collection and analysis, measurement, and communication and interpretation of results at a basic level. The experiment/report lacked organization, making it difficult to interpret and follow. The report includes Title. Introduction, Materials and Methods, Results, and Discussion sections but deviates significantly from the teacher-designated format. There was limited evidence of the students’ knowledge and understanding of the scientific concepts and vocabulary addresses. Conclusions provided an unclear explanation of the results but the student completely failed to address one or both of the following: experimental error and possible recommendations for new avenues of experimentation and/or real-life applications.

1 (Incomplete)**-** Rating: Several of the components of the experiments- objectives, background information/research, hypothesis(where applicable), variables, procedures, results, observation, and conclusions-have not been addressed and no elaboration is present. Student has demonstrated very little understanding of the scientific process and has displayed minimal ability to correctly use scientific equipment. Student has demonstrated very limited performance in only a **few** of the process skills-observation, inferences, prediction (where applicable), data collection and analysis, measurement, and communication and interpretation of results. Experiment/report lacked organization making it difficult to interpret and follow. The report does not include all of the following sections: Title, Introduction, materials and Methods, Results and Discussion and deviates significantly from the teacher-designated format. There was limited evidence of the students’ knowledge and understanding of the scientific concepts and vocabulary addressed. Conclusions were completely missing or did not provide an explanation of the results.

\_\_\_\_\_ Format does not include necessary information

\_\_\_\_ Headings are not included or correct

\_\_\_\_ Identifying information

\_\_\_\_\_ Procedure or Methods section does not include all detailed information to allow the reader to reproduce the activity with similar results-Section must be more specific.

\_\_\_\_\_ Procedure or Methods Section is not readable

\_\_\_\_\_Section should be in a numbered list/command form

\_\_\_\_\_Grammar issues make the section confusing and hard to follow

\_\_\_\_\_Data is not presented in a way to allow the reader to understand what was collected

\_\_\_\_\_No table is present

\_\_\_\_\_No graphs are present when they should be

\_\_\_\_\_Data does not contain units or description of what was measured

\_\_\_\_\_Conclusion section does not use real data to support or refute the hypothesis

\_\_\_\_\_Conclusions section does not analyze the error that may have contributed to a possible false conclusion

\_\_\_\_Conclusions does not discuss ways to change the procedure in order to reduce error

\_\_\_\_Other-