PRIME MINISTER'S SCIENCE PRIZES
AOTEAROA NEW ZEALAND

GUIDELINES FOR STUDENTS WRITING A REPORT ON A SCIENCE RESEARCH/ TECHNOLOGY or COMPUTER SCIENCE PROJECT

- The maximum length of your report is to be five A4 pages.
- In addition to your five page report a one page executive summary must be sent which is separate to the report.
- The Executive Summary should give brief statements of your aim, what you did, your main results and your conclusions in straightforward language that a non-expert can understand. It should not exceed one page or 500 words.
- Please use Calibri font size 12 for text, single spaced within paragraphs, with a one line or 6 pt space between paragraphs, and at least 2cm left and right margins in your report and executive summary.
- Photographs, graphs, data tables, raw data and log book material should be attached to your report as supplementary material or as an appendix.
- The Report should be clear and concise. The essence of a science or technology project is your personal thinking process. As well as documenting what you did, your Report should provide the judges with insight about your thinking process, from the early 'information gathering' stages, through the project work itself, to your final conclusions. The guidelines given below are not exhaustive. If you think something else is important, but not covered in the guidelines, feel free to add it.
- Please make sure the mentor (if applicable) completes the form in regards to their input into this work.
- **Your Report must be your own written work.** Plagiarism (inclusion of text segments copied from text from books, journals, the web or any other source, or presenting other people's ideas as your own) is not allowed and your work will not be considered. Checks will be carried out and so to put it simply – **DON'T.**
- Properly referenced citation of references and source material for your project is an important part of research and is encouraged. **Your reference list should include enough information for the reader to look up your sources.**

Plagiarism

Plagiarism is broadly defined as presenting someone else's work in a way that would lead those you present to, to assume it is your own. There are many forms of plagiarism. This usually refers to the content of written reports but can include other intellectual property such as adoption of other people's plans or concepts. There are two key "**don'ts**": (i) Don't include in your written report, any text you have found on the internet or anywhere else, even a single sentence, unless you rephrase the idea in your own words and reference it as a citation, or place the material in quotation marks to indicate it is not your own writing, if it is reported word for word. (ii) Don't repeat other people's experiments or technology projects

to obtain new data and present those as your own where you are not the person responsible for the thinking process that underpins and creates the project in its present form.

Set out your report under these headings if you have undertaken a science research project.

- Write your name at the top of each page
- Give your work a title
- Introduction: State the topic you investigated, and where the idea came from. Provide key points of background information that you began with. Selectively and succinctly summarise additional material collected later by information search.
- Aim/Hypothesis: The background information should lead you logically to either a deductive hypothesis (from this information we predict …) or an aim (e.g. to find out what happens if …) to be tested by data collection, usually in a designed experiment.
- Method: Describe here the measurements conducted. Reveal your thinking process by identifying (for example) why particular measurements were undertaken, what difficulties were perceived or needed to be overcome, and factors likely to affect the interpretation of the results. Give more technical details like controlled and uncontrolled variables where relevant. Describe the equipment used, and all other important details relating to the design of the experiment. Describe statistical analyses performed. Ideally there should be enough detail to allow someone reading your report to be able to repeat the experiment. The data collection described should be consistent with the hypothesis or aim(s) identified in the previous section. A photo or schematic diagram will often be very helpful.
- Results: Selectively, but as comprehensively as is practicable, summarise your data to illustrate the key points learned from them. Present your data primarily in Table or Figure format, with a few text sentences that highlight key points that will be mentioned in discussion below. Where statistical analysis has been carried out indicate relevant information such as standard errors or statistical significance levels. Judges need to see the raw data to see how you obtained the Tables and Figures you present in your report, therefore include the complete set of raw data as an appendix
- Discussion Here provide the reader with a critical analysis of the data collected and what they mean. For example: Were there difficulties carrying out the experiment or collecting particular data? What have you identified as possible sources of error and uncertainty in your data collection or experimental technique, how significant are these potential errors and do they affect the conclusions? With the benefit of hindsight is there anything you would do differently? Were your results obtained consistent or inconsistent with the initial hypothesis or met the aims identified? Are there alternative possible explanations for the data? Where possible compare your findings with other available information, and provide a reference (with details listed below) for interested readers to follow up. Are there follow up questions that arise that were not foreseen at the beginning?
- Acknowledgements: It is very important for you to note any help that was received whether it was from a mentor, teacher, parents, etc and what help they provided.
- References: Please list internet sites, books and articles which you have referenced in your *Introduction, Method* or *Discussion* sections. There should be enough detail to allow a reader to locate the information for themselves.

Set out your report under these headings if you have undertaken a technology project

- Write your name at the top of each page
- Give your work a title
- Introduction: State the topic you investigated, and where the idea came from. Provide key points of background information that you began with. Selectively and succinctly summarise additional material collected later by information search.
- Aim/Hypothesis: The background information should lead you logically to either a deductive hypothesis (from this information we predict …) or an aim (e.g. to find out what happens if …) to be tested by data collection, usually in a designed experiment.
- Method: Describe here the measurements conducted. Reveal your thinking process by identifying (for example) why particular measurements were undertaken, what difficulties were perceived or needed to be overcome, and factors likely to affect the interpretation of the results. Give more technical details like controlled and uncontrolled variables where relevant. Describe the equipment used, and all other important details relating to the design of the experiment. Describe statistical analyses performed. Ideally there should be enough detail to allow someone reading your report to be able to repeat the experiment. The data collection described should be consistent with the hypothesis or aim(s) identified in the previous section. A photo or schematic diagram will often be very helpful.
- Results: Selectively, but as comprehensively as is practicable, summarise your data to illustrate the key points learned from them. Present your data primarily in Table or Figure format, with a few text sentences that highlight key points that will be mentioned in discussion below. Where statistical analysis has been carried out indicate relevant information such as standard errors or statistical significance levels. Judges need to see the raw data to see how you obtained the Tables and Figures you present in your report, therefore include the complete set of raw data as an appendix
- Discussion Here provide the reader with a critical analysis of the data collected and what they mean. For example: Were there difficulties carrying out the experiment or collecting particular data? What have you identified as possible sources of error and uncertainty in your data collection or experimental technique, how significant are these potential errors and do they affect the conclusions? With the benefit of hindsight is there anything you would do differently? Were your results obtained consistent or inconsistent with the initial hypothesis or met the aims identified? Are there alternative possible explanations for the data? Where possible compare your findings with other available information, and provide a reference (with details listed below) for interested readers to follow up. Are there follow up questions that arise that were not foreseen at the beginning?
- Acknowledgements: It is very important for you to note any help that was received whether it was from a mentor, teacher, parents, etc and what help they provided.
- References: Please list internet sites, books and articles which you have referenced in your *Introduction, Method* or *Discussion* sections. There should be enough detail to allow a reader to locate the information for themselves.

Set out your report under these heading if you have completed an Electronics/Software project.

- Write your name at the top of each page
- Please add the title of your project at the top of the 1st page
- Concept/Introduction: (delete one as applicable)

  State what you set out to do with relevant background information. For example was this a client request, your own idea (if so what sparked your interest), a hobby, a reaction to a perceived deficiency with an existing product, or lack of an existing product for a particular need, etc. What is novel or a point of difference about your project compared to existing products?

- Information gathering: Briefly overview the information you collected before commencing this project, to help you with your planning and implementation. Where did the information come from (information, teacher, Bright Sparks, other mentor)? What are the key points of information (include internet links or references as appropriate)
- Design and Construction/Methodology (delete one as applicable)

  [In an organised way, describe for the judges your planning and building process. (i) Overview the design process; what were the key steps? Use of photos and/or diagrams is often helpful. (ii) Problems and solutions: In any project of this kind there are inevitable choices to be made relating to both HARDWARE and SOFTWARE used. Please state WHY key choices were made. A good way to do this is to identify alternatives considered for key components, your thinking about the pros and cons of the alternatives, and the reasons for the final choice you made.

  [Where creation of programming code, adaptation of a microprocessor/microcontroller to perform a non-factory function, or some other inventive effort was a significant part of your project, please report this with enough detail to allow an expert judge to understand how you perceived the problem and how you solved it. For example, key features of circuit diagrams, programming code, or similar component pieces of information necessary to complete the project as a whole should be explained succinctly and conceptually in the text section with a copy of the circuit diagram or code in an appendix for checking by the judges if required. If the details are not included or are too sketchy for verification, you might not be given credit for the work done.

- Evaluation: Here provide the reader with a critical analysis of your project and degree of success in reaching the intended outcome. Avoid assertions like “it works”. Provide objective data on key performance specifications like: what is the response time, the accuracy, the failure rate, (from testing), etc. Then make deductive logical assessments from the performance data. [(If relevant) Where to from here? Is there a logical next step in the development of your project?
- Acknowledgments: Please acknowledge any help you have received whether it was from a mentor, teacher, parents, insights gained from observing another project, etc and what help they provided

References: Please list internet sites, books and articles which you have referenced in your *Introduction, Method* or *Discussion* sections. There should be enough detail to allow a reader to locate the information for themselves.