

By participating in the Competition, the competitors agree to have their photos taken and used publicly and to have their names and images used publicly with respect to the Competition.

IV. RESEARCH REPORT

The Research Report enables the judges to evaluate the scientific work completed as part of the Competition. Semifinalists and Regional Finalists are selected on the basis of their Research Report. To ensure that the judges focus on the quality of the work completed, rather than on the manner of presentation, strict requirements for the Research Report must be followed. **Research Reports that do not adhere to these guidelines may be disqualified from the Competition.**

A. Overall Report Requirements

The Research Report must be written by the student(s). To ensure fairness, Research Reports are initially evaluated without reference to any personal information about the students.

Absolutely no student names or references to gender ("he" or "she"), high schools, school officials, advisors, mentors, affiliated research organizations, acknowledgements, or any other identifying information of the entrants are to appear anywhere in the Research Report.

Any piece of information that is not your own original text or common knowledge must be properly cited and quoted within the Research Report. You must also cite and quote any text from other published papers where you are an author. See Section III.E. for additional information.

All claims of novelty and/or substantial significance must be documented. If you choose to use superlatives such as "never before discovered," "state of the art," "best study to date," "new and novel idea," and similar superlatives, be prepared to provide extensive detail to support these statements.

B. Format Requirements

The Competition submission will include the Research Report, Abstract and all references.

- Be written in English.
- Adhere to an 18-page limit. This limit includes the introduction, text, tables, data, illustrations, and appendices. **NOTE: The Abstract and References are not included in the 18-page limit.**
- Double-spaced, with page numbers at the bottom.
- Have page margins of at least 1 inch.
- Use 12 point or larger **Arial or Times New Roman** font for the body of the report. **LaTeX** font is permitted for mathematical equations. Captions accompanying pictures and graphs, as well as citations for references, may be single-spaced and in a smaller point size.
- Uploaded only as a PDF document.

C. Content Recommendations

The suggested guidelines in this Section IV.C. are provided to help you understand the goals of each section of the Research Report. While the overall Research Report should provide the content as outlined under the following headings, the specifics stated below may vary slightly from one discipline to another. Subheadings should be used in Materials and Methods, Results, and Discussion to clarify the content, but sections such as Results and Discussion may be combined. The pages noted for each section are suggestions only.

Introduction: the "why" section (2-3 pages)

- Start with a broad picture of the problem you have chosen to study and why it is interesting. Provide a brief review of pertinent scientific literature, describe what information is missing and how your work addresses this gap in the literature. Previous relevant publications and patents must be properly cited in the text of the Research Report and included in the Reference section of your report.
- Describe the specific problem to be solved, the research question to be answered, the hypothesis(es) to be tested, or the product to be developed (if any). Provide a brief rationale for the research and why the work is important.

Materials & Methods: the "how" section (2-5 pages)

- Describe how you performed your work, giving sufficient detail so that someone trained in the field is able to understand what you did and can replicate it.
- Include the methods you used, written in a format commonly used in publications in your field of study. Do not merely restate a protocol or copy blocks of text; instead, use your own words to describe what you did, referencing key papers where appropriate.
- Explain your personal role in the work and the roles played by others in supporting this work. Include, for example, acknowledgments to others in the laboratory for running key instrumentation or other protocols. You may refer to others who assisted you by title but do not include any specific names in the body of your Research Report.
- Mention common procedures but there is no need to describe them in detail; provide references to where the method is published. All modifications of existing methods should be described.

Results: what did you find? (4-5 pages)

- Present your findings in sufficient detail so that the reader understands the results that were obtained or can follow each step of a mathematical proof.
- Describe how the results address the problem to be solved, the research question to be answered, or the hypothesis to be tested.
- Present all experiments, controls and statistical tests that show the results are reliable and statistically significant. In theoretical work, present the experimental findings against which the work was tested, the extent to which it was validated, or both.

Illustrations: documenting your findings (2-4 pages)

- Use illustrations to document the textual description of your results. Each illustration should be numbered in sequence and should be accompanied by its own legend. The illustration plus its legend should stand alone — the reader should understand it without having to read the text of the paper.

Discussion: what do your results mean? (3-4 pages)

- Provide readers with an interpretation of the results, enabling them to understand the implication(s) of your findings.
- Describe what makes your work unique in the context of published findings and what distinguishes it from that of others in the field, or in your laboratory. In other words, put the work in context with other reports that ask the same or related questions, and address whether or not your observations are consistent with or enhance other findings in the field.

Conclusions and Future Work: what did you learn and what's next? (1-3 pages)

- Recap briefly what was learned from your research and how your work addresses the unanswered question(s) that you posed in the introduction.
- Assess the validity of the conclusions, which is an important component of any scientific report. In particular, are your conclusions fully supported by the results described in the report alone or in conjunction with prior literature? Are there alternative explanations for your observations that cannot be ruled out?

- Determine what experiments could be performed in the future to refine your conclusions.
- Indicate what you would do next if you had more time, and what would you do differently if you were to start the work today.
- Consider what questions still remain to be answered.

D. References (not included in 18-page limit for the Research Report)

Citations and references must be in complete and correct standard format for the discipline. Consult with a teacher in your science or math department, or your mentor for assistance.

References must be included in the Research Report. Each individual reference should be single-spaced with a double space between references.

Any piece of information that is not your own original text or is not common knowledge must be properly cited and quoted within the Research Report. This includes facts, techniques and information from other sources (e.g., print, web-based, oral). It is not sufficient to simply modify the words of an original source. All images, figures, histograms, diagrams, graphs, data, must be cited.

If you plan to use an electronic source, you may use hyper-links. If that hyper-linked source requires a login, subscription, or any information that may not be available to Siemens Competition judges, you must provide the cited information as text within your resources. If you used the essential idea (whether a primary or secondary source), you must properly cite the source. You must also cite and quote any text from other published papers where you are an author.

E. Abstract (not included in the 18-page limit for the Research Report)

The Abstract should be the first page of the submitted report and is a technical synopsis of the problem, methods, results and conclusions. It should be double-spaced using 12 point or larger Arial or Times New Roman font, 100-200 words long, and include the Research Project title at the top.

No identifying information, such as name, high school, or references to gender or research facilities should be included in the Abstract. [Click here](#) for Sample Abstracts from previous winners.

The Abstract is **not included** in the 18-page limit for the Research Report.