**Research Paper Title**

(Insert a photo here – it helps to capture your reader’s attention, plus it allows you to communicate about your work visually; use an interesting image, or even one of yourself working)

**Student’s Name**

**Student’s School**

**Student’s Grade**

**Category -choose from:**

* **Environmental science; Earth and Space Science**
* **Engineering**
* **Physical Sciences, including chemistry, physics, and astronomy**
* **Life sciences**
* **Medicine and Health; Behavioral and Social Sciences**
* **Mathematics and Computer Science**

**Student’s Age**

**Investigative Research Paper**

**Advisor’s Name**

# Abstract

A description of the whole project in 250 words or less. It tells the reader about your topic and what you think is important. (1-2 paragraphs)

# Acknowledgements

Acknowledgement of major assistance received;

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If applicable, statement that "research involving non-human vertebrates or human subjects was conducted under the supervision of an experienced teacher or researcher and followed state and federal regulatory guidance applicable to the human and ethical conduct of such research";

# Introduction

The introduction is where you outline the need for your research. It should discuss work others have done. None of your research is outlined in the majority of the Introduction. Rather, it lays the ground work so that the reader can understand why your research is important.

End this section by specifically addressing the Purpose of this work and your Hypthesis(es):

The purpose of this research is:

This is a statement of the purpose of the study/experiment, including clear objectives. What are the applications of this work? Why is this study important? Be sure that you show recognition of the implications or importance of this work.

The hypothesis is:

Clearly state your hypothesis, based on your background research and knowledge.

# Materials and Methods

This provides a detailed description of the experiments and the design of the experiments. What were your variables and controls? Did you develop any new/novel techniques? Include any details which are important to your experiment. Use complete sentences.

This section is important because it is where your peers learn what you did. A rule of thumb is that you should provide enough information so that your work could be replicated successfully.

# Results

This is where you present the data you collected. You do not infer anything from the data yet; that is discussed in the next part of the report.

The results section is an organized summary of your data. You provide your readers with proof of your work. Tables, graphs, charts, and photographs are good means to communicate your results.

# Discussion and Conclusions

Here is where you discuss what your data show and you explain how you interpreted your data. You should include any statistical analyses you performed in this section as well. Discuss possible sources of error. Are your results valid? Accurate? Precise?

After you’ve discussed the significance of the findings, state your conclusions. Was the hypothesis proven? Disproven? If the results were not what you expected, do you have any idea why they outcome was different?

Your conclusion must flow from your results and relate to your hypothesis (whether or not the hypothesis was supported).

# Future Work / Next Steps (call it whichever you prefer)

End by discussing next steps. Based on what you learned, what would you like to do differently? What are future research projects that can come from this work? This would include predictions, ideas about refining your study or increasing precision or accuracy, new questions raised, or what the next logical step would be if you continued this work.

# Bibliography

List all the works you referenced in your background research.

This serves as a resource for readers. Materials you read or people you talked with while preparing for, designing, and writing about your research. Be consistent. For each reference, you will include some general information such as the last names and initials of all authors and editors, titles, dates of publication, and other publication information. Titles of books, journals, magazines, and newspapers are usually italicized or underlined. If you used an online source, be sure to include the date you visited the site because web pages can be edited or changed.

# Appendices

Only include if necessary.

A rule of thumb when it comes to appendices is that you cannot expect your reader will look at them. If information is critical to understanding your research, it needs to be included in the main body of the report. Appendices are simply supporting documents.

Whatever is attached should be short and relevant to your work. Graphs or charts that did not fit in your paper may be in the appendices. Other possibilities for appendices would be source code for computer programs that you authored for your project, or diagrams explaining life cycles or metabolic pathways, etc. that are relevant to your work, or a few photos that are relevant to the project. It is appropriate for some projects to have a "definition of terms" in the appendices.

# Tips

Here are things to keep in mind as you are doing your work:

Your research paper is following Junior Science and Humanities Symposium guidelines. If you have questions, always turn to JSHS guidance for the answer at <http://www.jshs.org/Paper_Submission.html>.

There is a good resource you can print at: <http://www.jshs.org/forms/Ntl%20student%20guidelines.pdf>.

The paper should be a minimum of 5-6 pages and a maximum of 20 pages, including appendices.

Graphs, tables, diagrams, charts, or other graphic representation should be simple to allow the judges on-line access to the research paper.