



# The Comprehensive Researcher's Handbook

*Edition: 1st Year of Innovation*

Welcome to the Global Research Challenge, a joint initiative by Synthica and the National Student Research Institution (NSRI). This program is dedicated to redefining high school research.

This exhaustive guide expands upon the official Research Template and the Judging Rubric. It is designed to take you step-by-step through the preparation, drafting, and finalizing of your academic manuscript. Your final application and paper deadline is **May 23, 2026**.

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## PART I: MANUSCRIPT FORMATTING

The presentation of your research is the first thing our judges will evaluate. You must use the official Global Research Challenge Template.

### 1. Header and Institutional Branding

- Every page must maintain the official headers containing the Synthica and NSRI logos/text. Do not alter the margins or placement of these institutional markers.

### 2. Title and Authorship Formatting

- **Author Names:** List all authors clearly below the title.
- **Institutional Affiliations:** Use superscript numbers (e.g., <sup>1</sup>, <sup>2</sup>) to link authors to their respective institutions or research groups. For example, indicate if you are part of the "Synthica Research Group, Remote" or an academic institution like "Harvard University, Cambridge, MA, USA".
- **Equal Contribution:** If multiple researchers contributed equally to the paper, place an asterisk (\*) next to their names and include a corresponding footnote stating "\*Contributed equally".

### 3. Typography and General Layout

- **Font:** Use a standard, highly legible serif font (such as Times New Roman, 12pt) for the body text to ensure academic professionalism.

- **Spacing:** Maintain consistent line spacing (1.15 to 1.5 is recommended) to allow judges room for annotations.
  - **In-Text Citations:** All claims must be supported by superscript numerical in-text citations (e.g., <sup>1,2</sup>). These numbers must perfectly align with your Works Cited section at the end of the document.
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## PART II: THE JUDGING RUBRIC

Before drafting, you must understand exactly how your paper will be scored. To achieve an **Expert (3)** rating across the board, your manuscript must satisfy the following stringent criteria:

### A. Integration of Knowledge & Synthesis

- **The Goal:** You must synthesize 3 or more distinct scholarly perspectives into a completely unique argument.
- **The Pitfall:** A "Novice" paper fails to link learned concepts or simply lists facts. A "Proficient" paper summarizes well but lacks original synthesis.
- **Actionable Advice:** Do not just report what other scientists have said. Compare their findings, find the gaps in their research, and use those gaps to construct a new, forward-looking implication in your concluding remarks.

### B. Topic Focus & Thesis Strength

- **The Goal:** Your thesis must be a falsifiable, analytical claim. It must act as a roadmap for the rest of the manuscript.
- **The Pitfall:** Broad statements like "climate change affects the ocean" will score poorly.
- **Actionable Advice:** Narrow your scope. Address a specific variable within a specific environment over a specific timeline.

### C. Depth of Discussion & Authorial Voice

- **The Goal:** Your original analysis must outweigh quoted material. Quotes should only be used to *anchor* your unique arguments.
- **The Pitfall:** If more than 30% of your paper relies on direct quotes, you are merely "narrating" others' work and will fall to the "Apprentice" level.
- **Actionable Advice:** Paraphrase effectively and focus on explaining the "why" and "how" behind the data, rather than just stating what the data is.

### D. Structural Cohesiveness

- **The Goal:** Your logic must be seamlessly tight. Use bridge sentences to link paragraphs.

- **The Pitfall:** "Patchwork" writing where paragraphs feel isolated. If your paper makes no sense when the section subheadings are removed, it lacks cohesiveness.
- **Actionable Advice:** The last sentence of a paragraph should naturally lead into the first sentence of the next.

## E. Technical Rigor

- **The Goal:** Zero errors in spelling, grammar, or citation formatting.
- **The Pitfall:** Informal language, slang, or pervasive typos will undermine your academic authority and drop your score significantly.

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# PART III: SECTION-BY-SECTION DRAFTING GUIDE

Your paper must follow the exact section headers provided in the GRC Template.

## I. The Abstract

- **Placement:** The Abstract sits at the very beginning of the paper.
- **Drafting Strategy:** This is an abstract that normally you would write at the end of your research because you don't want to write a summary about something you haven't even finished. So save this part for the last please.
- **Content:** It should strictly be 150-250 words. It must contain your core question, a brief mention of your methodology, your primary result, and the ultimate significance of your findings.

## II. Introduction

- **Purpose:** To introduce the specific problem you are investigating and provide the necessary background information.
- **Execution:** Begin with a broad hook related to your field, then rapidly narrow down to your specific research question. This section must house your falsifiable thesis statement. Ensure you are using appropriate in-text citations to establish the current state of the field.

## III. Methods

- **Purpose:** To prove to the judges that your research is reproducible, ethical, and scientifically sound.
- **Execution:** Detail your experimental design, data collection processes, and analytical frameworks. If you used specific software, datasets, or laboratory equipment, name them. A reader should be able to take this section and replicate your exact study.

## IV. Results

- **Purpose:** To present your raw data without bias or subjective interpretation.
- **Execution:** State what you found. Use quantitative data wherever possible.
- **Figures and Tables:** This section should heavily utilize visual aids. Any graphic used must include a clear, descriptive label beneath it, formatted exactly as: "Figure 1. A description of the figure". Ensure all figures are directly referenced in the text (e.g., "As seen in Figure 1...").

## V. Analysis

- **Purpose:** This is where you achieve the "Expert" score in Synthesis. You must interpret the Results section.
- **Execution:** Do not introduce new data here. Instead, explain what the data *means*. Why did the results turn out the way they did? How do these results prove or disprove the thesis you established in the Introduction? Cross-reference your findings with the literature you cited earlier to build a cohesive, unified argument.

## VI. Conclusion

- **Purpose:** To summarize the investigation and provide forward-looking implications.
- **Execution:** Restate your thesis (in different words) and synthesize the main points of your Analysis. Conclude with a strong statement regarding how your research advances the field or impacts real-world applications.

## VII. Improvements

- **Purpose:** To demonstrate scientific maturity by acknowledging the limits of your own study.
- **Execution:** No research is perfect. Did you have a small sample size? Were there confounding variables you couldn't control? Identify these explicitly. Then, propose exact methodological improvements that future researchers could implement to solve these issues.

## VIII. Evaluation

- **Purpose:** To critically assess the success and validity of your research journey.
- **Execution:** Reflect on the process. Evaluate the reliability of the sources you used and the efficacy of your chosen methodology. Did the project meet its intended goals? What skills or insights did you as a researcher gain from this specific academic endeavor?

## IX. Works Cited

- **Purpose:** To rigorously document every external source used to build your argument, adhering strictly to formatting standards.
- **Execution:** Your references must match your superscript in-text citations. Based on the template, you should use a bracketed numbering system and standard MLA formatting.

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## PART IV: FINAL SUBMISSION CHECKLIST

Before submitting your manuscript for the May 23, 2026 deadline, cross-reference your work against this final checklist:

1. **The "Headless" Test:** Have I read my paper without looking at the section headers? Does the logic still flow seamlessly?
2. **The 30% Rule:** Have I used a word counter to ensure my direct quotations make up significantly less than 30% of my total word count?
3. **The Data-Conclusion Link:** Does my Conclusion introduce any claims that are not directly supported by the data in my Results and Analysis sections? (If yes, revise to remove logical leaps).
4. **Formatting:** Are my authors listed correctly with superscript affiliations? Are my figures captioned correctly? Did I save the Abstract for last?
5. **Proofreading:** Has the document been reviewed multiple times to ensure zero spelling or grammatical errors, securing the Expert tier in Technical Rigor?