# Research Memo Guide

## 1 Overview

The purpose of this research memo is to detail your team's research process, methodology, data analysis, and interpretation of results in a short, structured memo.

## 2 Memo Outline

Your memo should have the following sections:

- **Overview**: Briefly describe your research question and why it is important to the scientific community. (1 paragraph)
- **Data selection and analysis**: Describe the data selection, what specific data was used, analysis techniques, and any assumptions. Justify your choices (e.g., why your team selected specific cells, measurement parameters, time periods, etc.). (3 paragraphs)
- **Results**: Present the findings, using visuals. Tables or plots should have clear captions. Plots should have appropriate labels, units, axis ranges. (2 paragraphs)
- **Discussion**: Interpretation of results, limitations of the analysis. (2 paragraphs)
- **Conclusion**: Summarize findings, answers to the research question, and suggest potential directions for future work or unresolved questions. (1 paragraph)
- **Author Contributions**: List the name of each team member and describe how each member contributed to the final components of the Team research project — including analysis, coding, summary slide, and memo. (1 paragraph)

## 3 Research Memo Grading Rubric

| Criterion | Excellent | Proficient | Developing | Needs Improvement |
|---|---|---|---|---|
| **Overview** | Provides a clear, concise description of the research question and its scientific importance. Compellingly highlights relevance. | Adequately describes the research question and its importance to the scientific community. | Provides a basic description of the research question but lacks detail or clarity on its scientific relevance. | Lacks a clear research question or fails to convey its importance to the scientific community. |
| **Data Selection and Analysis** | Describes data selection, analysis techniques, and assumptions thoroughly. All choices are clearly justified | Covers data selection, analysis, and assumptions adequately, with some justification for choices made. | Provides limited detail on data selection or analysis, with insufficient or weak justification of choices. | Lacks clear information on data selection, analysis, or assumptions. No justification for choices is provided. |

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| | and logically sound. | | | |
| **Results** | Findings are presented clearly with well-designed visuals. Captions, labels, units, and axis ranges are accurate and informative. | Results are clear, and visuals are mostly appropriate, though captions or labels may lack minor details. | Results and visuals are presented but lack clarity or complete labeling. Captions and axes may be unclear or inconsistently labeled. | Results are poorly presented. Visuals are missing, confusing, or lack essential information (captions, labels, units, axis ranges). |
| **Discussion** | Insightfully interprets results, addressing limitations and providing a nuanced understanding of the findings. | Provides a clear interpretation of results with some discussion of limitations but lacks depth or nuance. | Basic interpretation of results with limited discussion of limitations. Misses some connections to findings. | Lacks meaningful interpretation of results and does not address limitations, resulting in a superficial discussion. |
| **Conclusion** | Clearly summarizes findings, answers the research question, and suggests relevant directions for future work or unresolved questions. | Summarizes findings and answers the research question. Offers a suggestion for future work, though it may be broad or general. | Provides a limited summary of findings with minimal connection to the research question and vague suggestions for future work. | Fails to summarize findings or address the research question. Does not suggest directions for future work or unresolved questions. |