

Basics Of Scientific Research Reports

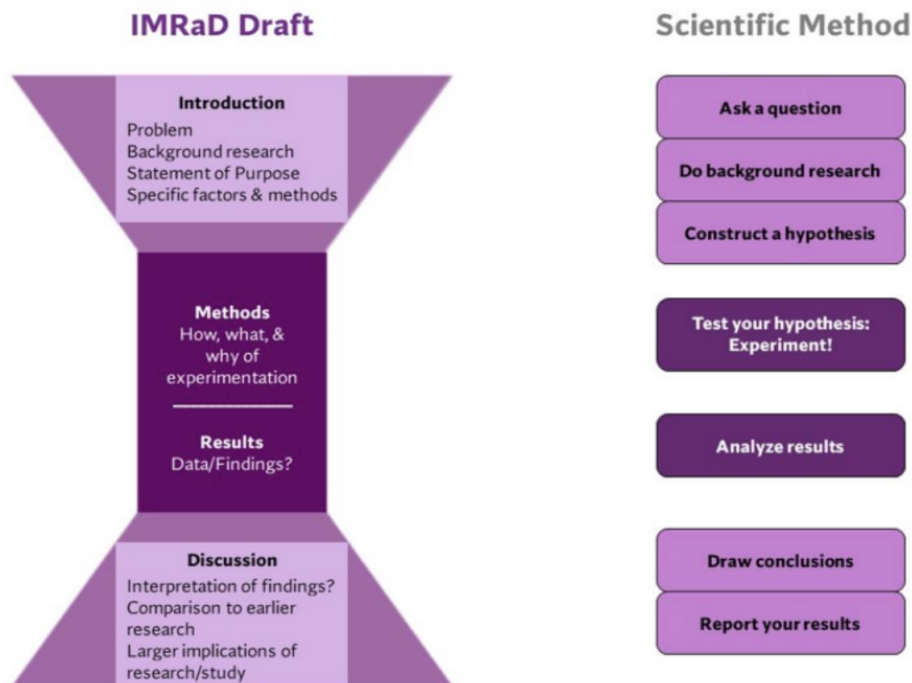
The scientific method involves developing a hypothesis, testing it, and deciding whether your findings support the hypothesis. A scientific research report speaks to the legitimacy, value, and reliability of the study you have conducted. Robust supporting data and skillful interpretation of the results will convince your reader of the validity of your findings.

Generally speaking, science writing follows the IMRaD/C template. This format is often used for lab reports and for reporting any planned, systematic research in the social sciences, natural sciences, or engineering and computer sciences.

- [Abstract]*
- Introduction
- Methods and Materials
- Results and
- Discussion/Conclusions

*Although research papers prepared for publication typically include an abstract, your professor may not require one. Double check the assignment instructions.

¹The format of a research article in the sciences mirrors the scientific method:



Figures adapted from chart in *Scientific reports* (2021) and hourglass representation in *Writing a Scientific Manuscript* (2021)

Introduction: make a case for your research

The introduction explains why the research study is necessary or important. First, provide some context to orient those readers who are less familiar with your topic. Next, reveal a “gap” in understanding that will be addressed by your research. A hypothesis containing both an independent and a dependent variable may be presented at the end of the introduction.

Methods and materials: explain how you conducted the research

The methods section tells readers how your study was conducted using a qualitative, quantitative or mixed methods paradigm with a rationale for the procedure. It includes enough information about your population, sample, methodology, and equipment to allow another researcher to duplicate your study. Methods sections typically use subheadings, the passive voice, and verbs in the past tense. (See the BU Writing Centre handout on the *Passive Voice*.)

Results: report what you found

In this section, you present your findings without any explanation, analysis or comments. Results sections are usually written in the past tense. All tables and figures are labeled and numbered separately; captions appear above tables and beneath figures. Avoid putting information in tables that also appears in the text or that can be summarized in one sentence.

Discussion: explain the implications of the findings

In this section, explain whether the data support your hypothesis, acknowledge any anomalous data or deviations from what you expected, draw conclusions, relate your findings to earlier work in the same area (if possible), explore the theoretical and/or practical implications of the findings, and finally, discuss limitations of the study, which may serve as avenues for future research. If, after performing a study or experiment, you recognize a flaw in the methodology, you can suggest a future modification in the experimental design to better test the hypothesis.

Abstract: summarize the entire study

The abstract provides a short overview of the entire paper, including a sentence or two about the study’s purpose and importance, a sentence or two about the methods, a few sentences that present the main findings, and a sentence or two about the implications of the findings. (See the BU Writing Centre handout on *Abstracts* for further detail.)

For a more in-depth explanation of aspects of the research report, visit the following links:

<https://writingcenter.unc.edu/tips-and-tools/scientific-reports/>

<https://writingcenter.unc.edu/tips-and-tools/sciences/>

<https://www.nature.com/scitable/topicpage/scientific-papers-13815490/>

Material adapted from:

Huffman, S., Cotos, E., & Becker, K. (2023). *Preparing to Publish*. Iowa State University Digital Press.

<https://writingcenter.gmu.edu/writing-resources/imrad/writing-an-imrad-report>

Material sourced from:

¹<https://www.studocu.com/row/document/north-china-university-of-technology/social-psychology/handout-science-writing-and-imra-d-the-basics/79347649>

