WSU
Writing Center

Writing a Scientific Paper

After the title, scientific papers generally include sections labeled abstract, introduction, materials and methods, results, a discussion (or conclusion), figures, and literature cited. Unless otherwise instructed, use past tense (-ed verbs) and passive voice ("sodium was added to the mixture" not "we added sodium to the mixture").

The **title** is a short but specific phrase describing your experiment.

"The effect of differing fertilizer amounts on *brassica rapa* subspecies *oleifera*" is good. It's hard to tell what a paper titled "Mustard Lab Report" might be about.

The **abstract** is a paragraph summarizing all the major points of the paper.

Likely covered are your research question, hypothesis, design of experiment, major findings, and a brief note on the significance of those findings.

The **introduction** fully covers the background and significance of your research.

Define key processes and concepts.

Explain the importance of your study—*not your results*—in more detail here than in the abstract. You might also cite other articles to back up your reasoning.

The **materials and methods** section tells the story of your experiment.

To minimize the risk of accidental plagiarism, try to write the story from your pre- and post-labs or your notes instead of your lab manual. Chances are, you did things a little differently from the manual, and it's important to record what *you* actually did.

Use specific names for things, even if it feels wordy: "the plate with no *E. coli*" or "plate 3" instead of "it." Include the exact values you recorded whenever you took a measurement, and attach the right unit every time.

The **results** section is where you report, but don't analyze, your data.

Explain very clearly where you got your data from—whether qualitative or quantitative. Pay attention to trends, even unexpected ones; point out seemingly random results as well. Figures often go in this section.

The **discussion** and **conclusion** sections might be separate or combined.

For the **discussion**, analyze the patterns (or non-patterns) in your results and think about what they might mean. Are they reliable?

In the **conclusion**, explain the big picture you get from your results.
Did you prove or disprove your hypothesis? If you proved it: how? If you didn't: why not? Was it experimental error, or do you need to reconsider your ideas?

Figures are charts, graphs, photos, drawings, or any visual record of your experiment.
Professors might want these before or after your literature cited, or integrated into another part of your paper. Label your figures something you can reference in your paper like a citation (such as "figure 1") and give them a short caption explaining what their data represent.

The **literature cited** section is just like a bibliography.
Scientists use an array of citation styles. Follow the assignment, syllabus, or instructor guidance. Use web sources as resources to check your citations.

Most importantly: **if you mess up, 'fess up.**
Mistakes are part of being human and part of doing science.
Don't change or make up data just to get the "right" answer.
Mistakes are an excellent opportunity to add depth to your lab report. In your discussion section, talk about what went wrong and why. Feel free to get creative. Think about how it might have affected your experiment and the implications for your conclusion. Showing you understand your own work and can think critically about it is much more impressive than showing you can perfectly follow a lab manual (or convincingly lie about it).