

*A free guide from Elevate STEM*

# How to Write a Research Paper

A research paper is how you tell other people what you found. It has five parts, and each one has a specific job. We'll use a simple experiment the whole way through: does blue light help bean plants grow?

## 1. Introduction

This is where you explain what your research is about and why anyone should care.

- **Background.** What do scientists already know about your topic?

*Scientists have studied how plants grow under different light, but they still don't know which light works best for every plant.*

- **Problem.** What question hasn't been answered yet?

*We don't know whether blue light helps plants grow faster than regular sunlight.*

- **Objective.** What is your study trying to find out?

*This study tests whether blue light makes bean plants grow taller than sunlight does.*

**Tip:** write the introduction last. It's a lot easier once you know what your results are.

## 2. Materials and methods

What you used, and exactly what you did. Someone should be able to repeat your experiment from this section alone.

- **Subjects or samples.** What or who did you study?

*50 bean plants grown in small pots.*

- **Tools and equipment.** Machines, software, supplies.

*LED lamps for the blue-light group; a second group grew in regular sunlight.*

- **Procedure.** Step by step, what you did.

*We grew the plants for four weeks, watered them every three days, and measured their height once a week.*

- **Data collection.** How you recorded your measurements.

*Plant height, measured with a ruler and written in a lab notebook.*

## 3. Results

Just what you found. Save the "what it means" for the next section.

- **Key numbers.** Averages, totals, anything important.

*Plants under blue light grew an average of 15 cm; plants in sunlight grew 12 cm.*

- **Graphs and charts.** A good chart makes your results obvious at a glance.

*A bar graph comparing average plant height for each type of light.*

## 4. Discussion

Now explain what your results mean and why they matter.

- **What you learned.**

*The plants grew taller under blue light, which suggests blue light supports growth better than sunlight.*

- **How it compares.** Do other studies agree or disagree with you?

*Similar studies also found that blue light helps plants grow.*

- **What went wrong.** Be honest about problems and how they might have affected your results.

*Some plants didn't grow well because their soil dried out too quickly.*

## 5. Conclusion

Wrap it up in a few sentences and point to what should come next.

- **Main point.**

*Blue light helps bean plants grow taller than sunlight.*

- **Next steps.**

*Future studies could test blue light on other kinds of plants.*

— The Elevate STEM team