

## Writing a Scientific Paper

**A scientific paper usually consists of**

Title  
Abstract  
Introduction  
Methods (or Materials & Methods, or Experimental Procedure)  
Results  
Discussion & Conclusions  
References

### Title

- Make it clear, concise and factual
- Include key words

### Abstract

- Summarise your research in  $\leq 200$  words, preferably  $\leq 100$  :
  - \* **Why** you did the research
  - \* **How** you did the research
  - \* The main **findings**
  - \* The main **conclusions**

### Introduction (Why?)

- Explain to the reader why you did the research:
  - \* What the **problem** is and why it is **worth studying**
  - \* How the problem fits into the **context of previous research**
  - \* What is your **purpose**, objectives, or hypotheses

### Methods (How?)

- Describe your procedure in sufficient detail so that someone else could replicate the research.
  - \* Include how the study was **designed**, e.g. experimental design
- Include how it was **carried out**, e.g.
  - \* the equipment (consider photographs/drawings )
  - \* the materials, subjects, specimens, samples (take particular care with names of chemicals, breeds, etc)
  - \* the method or procedure
- Include how the **data** was **analysed**
- Use the past tense.

## Results (What?)

Tell the reader what you found:

- Organise the results to highlight the **key** findings
  - \* Present data in **diagrammatic** form (graphs, tables, etc) whenever possible
  - \* Use the text to **draw the reader's attention** to key results in the graphs etc
  - \* Order the results so that they **link** to the **objectives** or hypotheses
- **Present** the results, but do not discuss them
- Be **meticulous** with graphs, labels, units, etc
- Use the past tense

## Discussion (So What?)

Point out to the reader the **significance** of the results

- Highlight the **important** findings
- Interpret the findings in relation to the **objectives** or **hypotheses**
- Discuss any sources of **error** and possible solutions
- Compare your findings with **previous research**
- Discuss the **implications** of your findings
- Discuss the **usefulness or limitations** of your research
- Suggest areas for **future research**
- Use past, present perfect and present tenses as appropriate (see our handout on tense use)

## Conclusions

This may be a separate section, or the final paragraph of the Discussion  
Be succinct and use the present tense

## References

Use the appropriate style for your discipline. For advice, see the sources listed below.

## Appendix

Include essential data too detailed for the body of the text.

## Useful sources on scientific writing

If you would like to know more about scientific writing, visit our website at: <http://ltl.lincoln.ac.nz/> or ask at the Service Point about the workshops, drop-in sessions, and individual appointments we offer.

**There are also many useful sources in the LU library. You could start with:**

Gallagher, J.N. & McKenzie, B. (1996). *Advice on Preparing a Scientific Paper*. (Rev. ed.). Lincoln University.

Emerson, L. & Hampton, J. (2005). *Writing Guidelines for Applied Science Students*. Palmerston North, New Zealand: Dunmore Press.

Knisely, K. (2009). *A student handbook for writing in biology*. Sunderland, Mass.: Sinauer Associates, Inc.

Silyn-Roberts, H. (2012). *Writing for Science: A Practical Handbook for Science, Engineering and Technology Students* 3<sup>rd</sup> ed. Auckland, New Zealand: Addison-Wesley Longman.

Silyn-Roberts, H. (2013). *Writing for Science: Papers, presentations and reports*. London; Waltham, MA: Elsevier Science. [E-book]

**Workshops**

**Drop-in**

**Appointments**