

MAG**KNOW**LIA is a service offering to help editing scientific papers (for a fee). On their website, <http://magknowlia.com/>, they provide several useful posters concerning tips on scholarly communication. These posters have been bundled together here for your convenience.

How to write an excellent article

Elements of your article

This poster tells you the main things to remember when writing each section of your paper.

Title

- Attract the reader's attention.
- Reflect the main topic(s) in the study.
- It should be concise and contain a few keywords.
- Avoid jargon, complex words and sensationalism.
- Be as short as possible without losing information.

Abstract

- An abstract should be structured as follows:
 1. Background
 2. Purpose of your study
 3. Methodology
 4. Results
 5. Summary of your conclusions
- It should be concise, informative and complete.
- In order to allow readers to find your paper use different keywords in title, abstract and keywords.
- As the abstract is a summary of your paper you should write it last.

Introduction

- Start by introducing your topic and field of research.
- Give background to what is known and not yet known.
- Explain what are you trying to find.
- Why is this significant?
- What are your specific aims?

Method

- The essence of this section is to show the reader what has been done and enable others to repeat your work.
- Only include methods in this section; the results come later.
- Describe the equipment, materials and procedures followed.
- Group experimental details clearly by subsections or in chronological order. Explain why you did what.
- If the methodology is new describe it clearly. Put lengthy procedures and details in an appendix and focus on the main points. If the methodology is established you can shorten your description and link to the relevant methods paper.

Results

- Give an overview of the most important/interesting results.
- List the subsidiary results either chronologically, or by most to least important.
- Relate all results back to the purpose of the experiment/hypothesis or approach.

Discussion

- Interpret the most important results/findings and relate them back to the original question.
- Evaluate how these results compare with previous findings. Do they support or contradict previous findings.
- List and address any limitations.
- Summarize the main findings, implications and the significance of the study.
- Recommend directions for future research.



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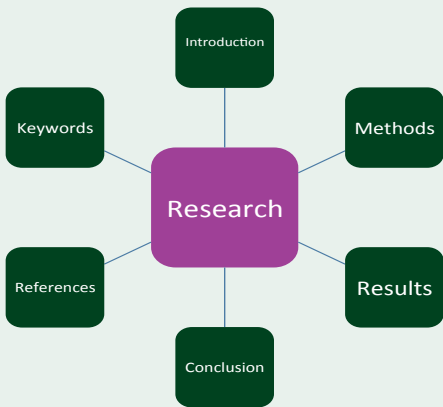
How to write an excellent article

Structure of your article

Writing order

Starting to write your paper can be a daunting task. There is so much you want to tell but where to start? First start with a mindmap in which you note all the relevant items. This way you won't forget and will keep the items within the structure.

Start writing with the things you have **done** and have **found** - your (1) **methods** and (2) **findings**. Follow with the (3) **introduction** that should give insight as to why you conducted your research. Follow by (4) **analysis** and (5) **discussion / conclusions**. As the (6) **abstract** is a summary of your paper you should write it last.



Breadth

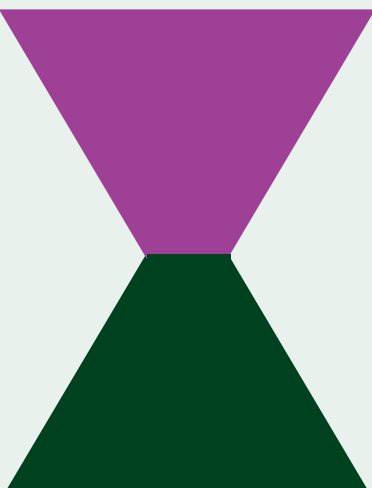
Your paper should resemble an hourglass . Your introduction should be broad and, as you go deeper and deeper into the matter, your focus becomes narrower and focuses on detail. After your analysis you'll broaden into the discussion, interpretation, conclusions and significance.

Introduction

Methods

Results

Discussion



| Order in which you write | Structure of the publication |
|----------------------------------|------------------------------|
| Mindmap | 1. Title |
| 1. Methods | 2. Abstract |
| 2. Findings/Results | 3. Keywords |
| 3. Introduction | 4. Introduction |
| 4. Analysis | 5. Methods |
| 5. Discussion | 6. Results |
| 6. Abstract / Title / Keywords | 7. Analysis |
| References / disclosures / notes | 8. Discussion / Conclusion |



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Words

Use simple words

Difficult words make it more difficult to understand your message. Use simple words instead.

Compare

| | |
|-------------|-----------|
| Equitable | fair |
| Expeditious | fast |
| Inception | start |
| Interface | meet |
| Caveat | warning |
| Designate | appoint |
| Impacted | changed |
| Sufficient | enough |
| Ascertain | determine |
| Endeavor | try |
| Terminate | end |

Avoid unnecessary words

'Wordiness' clouds your message - often just one word will do.

Compare

| | |
|--------------------------------|-------------|
| A considerable number of | many |
| Due to the fact that | due to |
| In the light of the fact that | because |
| It is of interest to note that | note that |
| Regardless of the fact that | even though |
| Due to the fact that | since |

Word endings

Some authors turn verbs into nouns during writing. This makes your writing less active. Watch out for words with the endings -ability, -ization and -ize.

Compare

- ***Changeability*** of color occurs when bleach is added.
- ***Metabolism*** of alcohol was not as expected.
- Frequent flyers will be ***prioritized***.

preferred

- Color ***can change*** when bleach is added.
- Alcohol ***was metabolized*** but not as expected.
- Frequent flyers will be ***given priority***.



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Sentences

Sentence length

Short sentences are easier to understand than long sentences. The ideal sentence length is 15-17 words. In science, because of its complex ideas the ideal sentence length is around 22 words.

Compare

- ☐ We conducted an evaluation to determine if the treatment improved the health of patients and increased their life expectancy. (20 words)
- ☐ We evaluated if the treatment improved health of patients and increased life expectancy. (13 words)

One idea per sentence

Write sentences that only contain one idea. Be concise and direct.

Compare

Three ideas per sentence:

- ☐ It is not entirely certain if testing cosmetics on animals is completely safe for researchers as they can be exposed to hazardous chemicals despite wearing safety equipment, therefore, further research is needed urgently.

Three separate sentences:

- ☐ When testing cosmetics on animals, researchers are exposed to hazardous chemicals. Despite wearing safety equipment, they are still at some risk. The safety of researchers under such conditions needs further research urgently.

Word location

The location of a word within a sentence influences its interpretation. Start your sentence with the main topic and put the word you want to stress at the end.

Compare

- ☐ The food was excellent, in spite of its very high price.

- ☐ In spite of the very high price, the food was excellent.

Linking topics

Word location is also important between sentences. Link sentences by placing relevant topics close to each other as shown in the second sentence.

Compare

- ☐ The price was very high, but the food was excellent. I had just enough money to pay.

- ☐ The food was excellent, but had a very high price. I had just enough money to pay.

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Paragraphs

Construction

A paragraph is a number of sentences around one single topic. If well constructed, a paragraph is like a story with a beginning, middle and an end.

1. The **topic** sentence at the beginning gives an introduction and overview.
2. Supporting statements are placed in the middle.
3. The stress sentence is the last sentence and either gives a **summary** or a **conclusion**.

Example

We spent many days discussing the place for our next scientific conference. We wanted somewhere warm, near an airport, with a good choice of restaurants and the location should be affordable. We looked at London, Lisbon and Siberia. Because it met all our criteria we chose Lisbon.

topic

summary /
conclusion

Linking sentences

Place related topics next to each other. By linking sentences the reader can follow the story more easily.

Example

Computerization of the production processes considerably changed the **production speed**. **The speed** was small in the beginning but **increased over time**. **The slow start** was probably due to the learning curve associated with the **complex software**. **Simplification** of the interface to decrease learning time is currently being investigated.



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Readability

First and third person (pronouns)

There is ongoing debate whether to use the first person (**we observed**) or the third person (**it was observed**). Some conclude that British English favors the third person whereas American English favors the first person.

The first person is generally seen as being more 'active and engaging' whereas the third person is being seen as more 'impartial and objective'.

Check the 'guide for authors' of the journal you want to submit to. If they state a preference always follow that preference.

Active voice

When writing use the active voice as much as possible, especially if you are writing using the first person. It engages the reader. Using the passive voice too much makes for dull reading.

Compare

Active

We observed no change in acidity.

Passive

No variation in acidity was observed.

Verbs versus nouns

Verbs are extremely important when writing English. You should avoid turning verbs into nouns. With strong and active verbs you will enliven and energize your writing! Try to **use verbs** when possible.

Verbs

measured
decided
compared

Nouns

a measurement was taken
a decision was made
a comparison was made

Noun clusters

When you have too many nouns together it can be difficult to understand how they relate. For instance, the nouns *The New Computer Design Project Documentation Outline* could mean:

Outline of the project documentation for the **new computer design**.

It could also mean:

The new outline of the **project documentation for the computer design**.



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Tables, graphs and figures

They say *a picture paints a thousand words* - how very true! Graphs and figures can convey your message quickly and easily. There are a small but important number of rules to apply. A good figure and caption should be understandable on its own, without the support of the main text.

Graph or table?

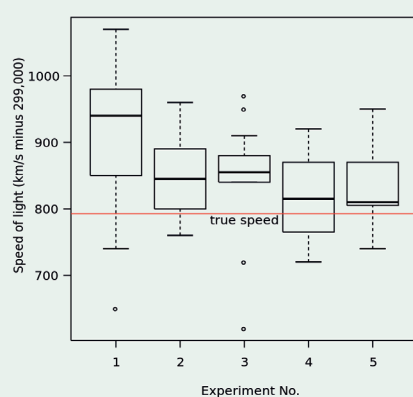
In general use a table when you want to show exact data, and use a graph if you want to visualize trends and relationships.

Photo or drawing

A photograph is a snapshot of reality and proof of observation. A drawing or diagram allows you to focus on certain aspects by controlling detail.

What kind of graph to use?

- Use line graphs for **dynamic** comparisons.
- Use scatterplots to find **correlation** within data.
- For **subdivision** and **comparison** use bar charts
- Pie charts show **relativity**.
- Use a box plot if you want to add **statistical details** like median, (interquartile) range and outliers.



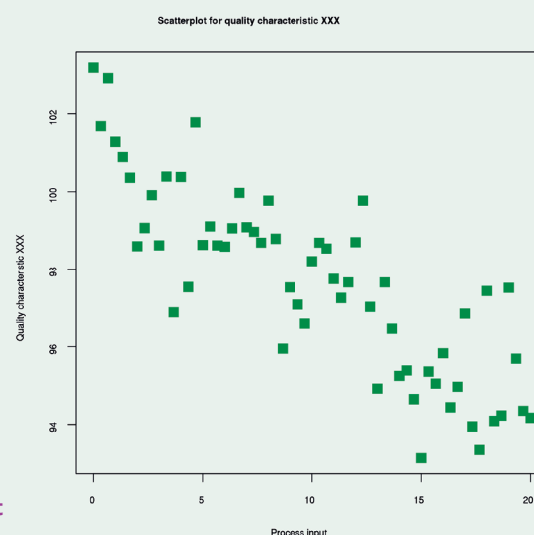
Box plot

Graph tips

- Place the **independent** variable (time) on the x-axis and the **observed** variable (findings) on the y-axis.
- Alert the reader clearly if you use different **scales** between graphs.

Table tips

- Keep your table as **simple** as possible.
- Only use **decimal** detail when (statistically) **relevant**, otherwise round numbers up or down to improve readability.
- Place known and familiar content on the left, new and important findings on the right.



Scatter plot

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Ethics

Trust

Science is a matter of trust; only those that have been with you in the lab can be 100% sure that you conducted the experiments you describe. Unethical publishing behavior is often caused unintentionally. Please be aware of the following forms of unethical publishing.

Plagiarism

Copying the work of someone else and passing it off as your own is plagiarism. Quoting text or even the ideas of someone else without acknowledgement is considered plagiarism. This is also true if you summarize or paraphrase the original work. Always acknowledge the author. If plagiarism is discovered your paper will be withdrawn which will damage your career.

Fabrication and falsification

Whilst forgetting to acknowledge an author can be an oversight, fabrication and/or falsification never are. An example of falsification is manipulating data, or ignoring the results that don't fit your hypothesis. Fabrication is inventing facts.

Submission

You should never submit your paper to more than one journal at the same time. Never submit a paper that has already been published somewhere else. You can, but only under very strict conditions, publish a paper in another language or adapt a scientific paper for a trade publication.

Authorship

Within scientific publishing you have ghost authors and gift authors. Gift authors are listed as authors although they haven't contributed enough to the work. Ghost authors should have been listed as authors but are not. In order to be listed as an author the following three conditions should **all** have been met:

1. A researcher should have contributed substantially to the concept and design of the research, the acquisition of data, or analysis and interpretation of data.
2. An author should have drafted the article or revised it substantially for intellectual content.
3. Each author should have read and given approval for the final version to be submitted.

Conflict of interest

You should avoid even the slightest hint of a conflict of interest. Even if such a conflict of interest is only perceived it will devalue your research and damage your reputation. Conflicts of interest can be:

1. **direct** – You publish on the risk of smoking whilst being a consultant for a tobacco company.
2. **indirect** – You publish on the risk of smoking whilst your partner is a consultant for a tobacco company.
3. **career** – The editor of the journal you are submitting to works at the same university as you.
4. **personal** – You publish on traditional healing whilst having strong negative feelings about this.

Any potential conflict of interest can be avoided by clear and open disclosure.



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Cover letter

A lot of papers being submitted for publication are rejected because of a poor cover letter. The cover letter is your introduction to the Editor in Chief. A good cover letter has the following elements:

1. Introduction

Address the Editor in Chief by name - only writing Dear Sir /Madam indicates laziness at best. Include the title of your paper and the article type in the first paragraph.

2. Background

Follow the introduction by explaining the background of your research, what is the problem you are trying to solve, and why was this research conducted?

3. Experiments and findings

Describe briefly what was done, how it was done and what you found.

4. Importance

Explain why this research is of interest to the readers of the journal you are submitting to.

5. Disclosure

Disclose clearly and openly any, (even if only potential), conflicts of interest.

6. Reviewers

Suggesting a number of reviewers will aid the Editor in his work. In addition, list any people who should not review the paper. In both cases give a brief explanation for your choices.



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The Impact Factor

Calculation

The Impact Factor (IF) is the most well known of all the publication metrics. A high IF indicates a good quality journal. The IF reflects the citations to recent articles divided by the number of recent articles.

$$\text{2015 IF} = \frac{\text{Citations made during 2015 to all articles published in 2013 and 2014.}}{\text{Research articles published in 2013 and 2014.}}$$

All citations within an article are counted and displayed above the line. Below the line **only** the number of **research** articles are counted. Not all article types will be included in the article count. A controversial editorial will get a lot of citations but is not a research article and will, therefore, not be counted.

The regular Impact Factor looks at a window of 2 years. In addition there is the **5-year Impact Factor** for slower moving fields. The '**immediacy index**' and '**citation half-life**' look at how fast a scientific field moves

Issues

There are a number of problems with the IF which means that it should be used with caution.

- A citation can be cited either in favor, or against, the work of the author. This is not recorded in the IF.
- The Impact Factor does not take into account the quality of the citing journal.
- There is a strong variation in citations between subject areas. You cannot compare an IF within mathematics with one in virology.
- It is far easier for a small journal to obtain a high IF than for a large journal.
- Only around 12.000 out of approximately 27.500 journals are registered for inclusion in the Impact Factor.
- Human error - regularly the wrong paper is cited.

Alternatives

Alternatives to the Impact Factor are:

- SNIP (Source Normalized Impact Factor)
- Eigenfactor
- Scimago Journal Rank
- H-index
- Altmetrics
- Impactstory



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