Title, Abstract and Keywords

The Importance of Titles

The title of your manuscript is usually the first introduction readers (and reviewers) have to your work. Therefore, you must select a title that grabs attention, accurately describes the contents of your manuscript, and makes people want to read further.

An effective title should:

* Convey the **main topics** of the study
* Highlight the **importance**of the research
* Be **concise**
* **Attract**readers

Writing a good title for your manuscript can be challenging. First, list the topics covered by the manuscript. Try to put all of the topics together in the title using as few words as possible. A title that is too long will seem clumsy, annoy readers, and probably not meet journal requirements.

Example:

*Does Vaccinating Children and Adolescents with Inactivated Influenza Virus Inhibit the Spread of Influenza in Unimmunized Residents of Rural Communities?*

**This title has too many unnecessary words.**

*Influenza Vaccination of Children: A Randomized Trial*

**This title doesn’t give enough information about what makes the manuscript interesting.**

*Effect of Child Influenza Vaccination on Infection Rates in Rural Communities: A Randomized Trial*
**This is an effective title. It is short, easy to understand, and conveys the important aspects of the research.**

Think about why your research will be of interest to other scientists. This should be related to the reason you decided to study the topic. If your title makes this clear, it will likely attract more readers to your manuscript.
*TIP: Write down a few possible titles, and then select the best to refine further. Ask your colleagues their opinion. Spending the time needed to do this will result in a better title.*

Abstract and Keywords

The Abstract is:

* A **summary**of the content of the journal manuscript
* A time-saving **shortcut**for busy researchers
* A **guide**to the most important parts of your manuscript’s written content

Many readers will only read the Abstract of your manuscript. Therefore, it has to be able to **stand alone**. In most cases the abstract is the only part of your article that appears in indexing databases such as Web of Science or PubMed and so will be the most accessed part of your article; making a good impression will encourage researchers to read your full paper.

A well written abstract can also help speed up the peer-review process. During peer review, referees are usually only sent the abstract when invited to review the paper. Therefore, the abstract needs to contain enough information about the paper to allow referees to make a judgement as to whether they have enough expertise to review the paper and be engaging enough for them to want to review it.

Your Abstract should answer these questions about your manuscript:

* What was done?
* Why did you do it?
* What did you find?
* Why are these findings useful and important?

Answering these questions lets readers know the most important points about your study, and helps them decide whether they want to read the rest of the paper. Make sure you follow the proper journal manuscript formatting guidelines when preparing your abstract.

*TIP: Journals often set a maximum word count for Abstracts, often 250 words, and no citations. This is to ensure that the full Abstract appears in indexing services.*

**Keywords**are a tool to help indexers and search engines find relevant papers. If database search engines can find your journal manuscript, readers will be able to find it too. This will increase the number of people reading your manuscript, and likely lead to more citations.

However, to be effective, Keywords must be chosen carefully. They should:

* **Represent**the content of your manuscript
* Be **specific**to your field or sub-field

Examples:

**Manuscript title:** Direct observation of nonlinear optics in an isolated carbon nanotube

**Poor keywords:** molecule, optics, lasers, energy lifetime

**Better keywords:**single-molecule interaction, Kerr effect, carbon nanotubes, energy level structure

**Manuscript title:**Region-specific neuronal degeneration after okadaic acid administration
**Poor keywords:** neuron, brain, OA (an abbreviation), regional-specific neuronal degeneration, signaling

**Better keywords:**neurodegenerative diseases; CA1 region, hippocampal; okadaic acid; neurotoxins; MAP kinase signaling system; cell death

**Manuscript title:**Increases in levels of sediment transport at former glacial-interglacial transitions

**Poor keywords:**climate change, erosion, plant effects
**Better keywords:** quaternary climate change, soil erosion, bioturbation

Figures and tables

Figures and tables (display items) are often the quickest way to **communicate large amounts of complex information** that would be complicated to explain in text.

**Many readers will only look at your display items** without reading the main text of your manuscript. Therefore, ensure your display items can stand alone from the text and communicate clearly your most significant results.

Display items are also important for **attracting readers** to your work. Well designed and attractive display items will hold the interest of readers, compel them to take time to understand a figure and can even entice them to read your full manuscript.

Finally, high-quality display items give your work a **professional appearance**. Readers will assume that a professional-looking manuscript contains good quality science. Thus readers may be more likely to trust your results and your interpretation of those results.

When deciding which of your results to present as display items consider the following questions:

* Are there any data that readers might rather see as a display item rather than text?
* Do your figures supplement the text and not just repeat what you have already stated?
* Have you put data into a table that could easily be explained in the text such as simple statistics or p values?

Tables

Tables are a concise and effective way to present large amounts of data. You should design them carefully so that you clearly communicate your results to busy researchers.

The following is an example of a well-designed table:

* Clear and concise legend/caption
* Data divided into categories for clarity
* Sufficient spacing between columns and rows
* Units are provided
* Font type and size are legible



Source: Environmental Earth Sciences (2009) 59:529–536

Figures

Figures are ideal for presenting:

* Images
* Data plots
* Maps
* Schematics

Just like tables all figures need to have a clear and concise legend caption to accompany them.

**Images**

Images help readers visualize the information you are trying to convey. Often, it is difficult to be sufficiently descriptive using words. Images can help in achieving the accuracy needed for a scientific manuscript. For example, it may not be enough to say, “The surface had nanometer scale features.” In this case, it would be ideal to provide a microscope image.

For images, be sure to:

* Include scale bars
* Consider labeling important items
* Indicate the meaning of different colours and symbols used

**Data plots**

Data plots convey large quantities of data quickly. The goal is often to show a functional or statistical relationship between two or more items. However, details about the individual data points are often omitted to place emphasis on the relationship that is shown by the collection of points. Here, we have examples of figures combining images and a plots in multiple panels.

For data plots, be sure to:

* Label all axes
* Specify units for quantities
* Label all curves and data sets
* Use a legible font size

**Maps**

Maps are important for putting field work in the context of the location where it was performed. A good map will help your reader understand how the site affects your study. Moreover, it will help other researchers reproduce your work or find other locations with similar properties. Here, we have a map used in a study about salmon.

For maps, be sure to:

* Include latitude and longitude
* Include scale bars
* Label important items
* Consider adding a map legend

**Schematics**

Schematics help identify the key parts to a system or process. They should highlight only the key elements because adding unimportant items may clutter the image. A schematic only includes the drawings the author chooses, offering a degree of flexibility not offered by images. They can also be used in situations where it is difficult or impossible to capture an image. Below is a schematic explaining how nanotubes could be used to harvest energy from a fluid.

For schematics, be sure to:

* Label key items
* Provide complementary explanations in the caption and main text

*TIP: it’s important to consider how your figures will look in print as well as online. A resolution of 72 ppi is sufficient for online publication whilst in print 100 ppi is recommended. You can adjust the resolution of your figure within the original program you used to create it at the time you save the file.*

*TIP: There are two main colour models; RGB which stands for red, green, blue and CMYK or cyan, magenta, yellow and black. Most microscopes will take images using the RGB however CMYK is the standard used for printing so it is important to check that your figures will display well in this format.*

Avoiding image manipulation

You should never knowingly manipulate your images to change or improve you results. To avoid inadvertent manipulation you should only minimally process your figures before submitting them to the journal, your submitted images should faithfully represent the original image files.

* Adjusting the brightness or contrast of an image, in fluorescent microscopy for example, is only acceptable if applied equally across all images including the controls
* The cropping of images in the creation of figures should be avoided unless it significantly improves the clarity of conciseness of presentation. Be sure that the cropping does not exclude any necessary information for the understanding of the figure, such as molecular markers in electrophoresis gels.
* Any adjustments or processing software used should be stated.

*TIP: keep copies of the original images, files and metadata used to create your figures as these can be requested by the journal during the review process.*

**Tables and Illustrations**

Place tables and illustrations as close as possible to the parts of the text to which they relate. A table is usually labeled *Table*, given an arabic numeral, and titled. Type both label and title flush left on separate lines above the table, and capitalize them as titles (do not use all capital letters). Give the source of the table and any notes immediately below the table in a caption. To avoid confusion between notes to the text and notes to the table, designate notes to the table with lowercase letters rather than with numerals. Double-space throughout; use dividing lines as needed.

Any other type of illustrative visual material—for example, a photograph, map, line drawing, graph, or chart—should be labeled *Figure* (usually abbreviated *Fig.*), assigned an arabic numeral, and given a caption: Mary Cassatt, *Mother and Child*, Wichita Art Museum.” A label and caption ordinarily appear directly below the illustration and have the same one-inch margins as the text of the paper. If the caption of a table or illustration provides complete information about the source and the source is not cited in the text, no entry for the source in the works-cited list is necessary.

Musical illustrations are labeled *Example* (usually abbreviated *Ex.*), assigned an arabic numeral, and given a caption: “Ex. 1. Pyotr Ilich Tchaikovsky, Symphony no. 6 in B, opus 74 (*Pathétique*), finale.” A label and caption ordinarily appear directly below the example and have the same one-inch margins as the text of the paper .