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How To Write A Good[1] Science Memo
Danny Jacobs
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Summary

A memo is a short communication which informs and documents. This is a template and a bit of advice. Remember, If You Aren't Writing It Down, You're Just Fooling Around. The memo is a step on the road to publishing. Stacks of notes = Memos, Stacks of Memos = Papers. Stacks of papers = Fulfillment

What to write and how to write it

Unlike a published paper a memo is written informally but unlike an email it is written with the explicit assumption that it will be read by others who have a detailed technical interest in your project. So, although the audience is technically savvy, your reader will be ignorant of the specific context you are facing. Introduce your purpose, problem, or question in a couple sentences. Then report whatever new bit it is you have to report. Technical details like plots or tables should be clearly labeled and discussed. What you are doing is often the written equivalent of showing a plot at group meeting. Explain why the plot exists and what you think it means.

Traps People Fall In

Dithering: Your goal is to button up a short experiment which broke, document a bit of background research that went nowhere, or record a plot that doesn't make sense. Don't spend weeks writing it up. Learn to write simply and to see your project from the outside.

Rushing: Even if your project is top secret, your memo still has an audience of other secret keepers. It is not a place to keep field notes or jottings. Do a good job.

How to organize memos

Keep them in a flat list, numbered sequentially. Don't get fancy. If they aren't secret, they should probably be online. Here are some examples:

http://reionization.org/science/memos/
http://loco.lab.asu.edu/memos/

Keep them organized. Elect one person in the project Memo Keeper, have them assign numbers. Or maybe have a single shared directory and let people take the next number. If they're worth anything (always an open question!) your memos will float around in email threads. Make sure they have your name, the memo number, your organization, and the date. This memo has such things in the header.

Can other things be memos?

People often take drawings, schematics, test reports or what have you and slap a number on it. This is super common in the loco memo series I mentioned above. Behold, the power of the integer. This is fine. Sure, it breaks my writing rules above. Knowing when to break the rules is the essence of cool.

Technical details

The font here is Times New Roman. It is a well known fact that serifs look better and make you smarter. The size is set to 10 because I wanted everything to fit on one page. This is memo 0 of the External Calibrator for Hydrogen Observatories project at Arizona State University. It was written in Google docs and is stored in Google_Drive/ECHO/Memos with all of the other memos in that project. Memos which are made public are downloaded as PDF, stored in Memos/Public_PDFs and then uploaded to danielcjacobs.com/ECHO/ECHO_Memos. This template was written in about 70 minutes on a Sunday morning.

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[1] A little hubris never hurts. Confidence!