

Keeping a laboratory notebook: Why and how?

August 26, 2004

Why keep a lab notebook?

- A *descriptive* record of what you did, when and how you did it, including a descriptive, pictorial or graphical record of your experimental results, analyses and interpretations
 - Anyone (including you) should be able to recreate your procedure from your description
 - To repeat or continue your work in your absence
 - To write a manuscript for publication
- A *legal* record of your work
 - Significant prestige or money can be associated with laboratory work and a lab notebook is a paper trail

What to put on your notebook

- On the exterior of your notebook:
 - Your full name
 - Semester and year of use
 - Course or general project name
- On the inside front cover:
 - Your mailing address, phone number, e-mail address
 - Contact info for advisor/lab director/instructor

How to start and maintain a laboratory notebook

- If pages aren't numbered, add them to top right- and left-hand corners
- Devote pages 1 and 2 to a Table of Contents:
 - Two columns:
 - Experiment name
 - Page number where experiment starts
- Never remove a page
- All pages should be filled sequentially
 - If you leave part of a page blank, draw an 'X' through unused area

How to start and maintain a laboratory notebook

- Handwriting should be neat and *legible* but doesn't have to be "picture perfect"
 - Pen (preferably a gel pen) or pencil (#2)
 - Ink should be resistant to spills
 - Pencil should not be used if work is subject to review by others
 - Cross out errors so they are still legible
 - Draw a thin line through mistake
 - Provide an unambiguous date for each entry
 - e.g., 26 August 2004

What should go in your notebook?

- Date
- Title: Short statement of what you're doing
- Purpose: Short statement of why you're doing it
- Method: Sufficiently detailed description of how your research activity is being done
 - Describe equipment, conditions, reagents, amounts, procedures
 - You may type out a detailed protocol and glue or tape it in

What should go in your notebook?

- Method:
 - Reference to a published or previously described protocol is okay, e.g. “according to the manufacturer’s instructions”
 - Describe any deviations from the referenced protocol
 - Record reagent and equipment details
 - Drawings/descriptions of field site locations, other important information
 - Photographs that document experimental details
 - Include names and locations of relevant computer files

What should go in your notebook?

- Data: Record observations, measurements or other kinds of data, such as pictures, data recordings, etc.
 - Construct tables for series of measurements, observations
 - Include labels on pictures if necessary
- Calculations: Record any calculations you perform
- Interpretations: Record any interpretations of your data (they may not be so obvious later)

What should go in your notebook?

- Data analysis: Include any statistical analysis or graphing of your data
- Conclusions: Summarize your data, analysis and any conclusions that you can form. Include:
 - Information about what worked and what didn’t
 - Did your results conform to what you expected?
 - How to modify the procedure in the future, if need be
 - What are your next steps?

How to keep a lab notebook

- How much time should you spend on your notebook? ⇒ Strike a balance:
 - Enough time so there is sufficient detail that your work could be reproduced and interpreted many years later
 - Not so much time that you spend most of your time keeping your notebook and little time doing your research

How will I grade your notebook?

- Is it legible? ⇒ 5 points
- Are your descriptions detailed enough that I could repeat what you did and understand why you did it? ⇒ 5 points
- Is your data and data analysis well-organized and interpretable? ⇒ 5 points
- Did you analyze your data correctly? ⇒ 5 points
- Have you stated your conclusions (based on your data and analysis) and noted any changes to be made, if necessary? ⇒ 5 points