How to keep a lab journal

Modified from the MSc Thesis Course Guide Wageningen University, available at https://sharepoint.wur.nl/sites/ESAinfo/diversen/owi%20reference%20site.aspx

Department of Soil Biology, June 2020
Suggestions for modifications? Please refer to Ellis Hoffland.

Your lab journal is a record of your aims, practical performance and results of experiments, and the processing and analysis of the results. It enables you to report your work at a later stage: to communicate with your supervisor and write your thesis. It is also important that the experiment can be repeated based on the descriptions in your lab journal.

You may also want to use your lab journal to record thoughts, ideas, etc., and to summarize and memorize the discussions with your supervisor and technicians.

Make sure that you record data as soon as possible in excel files as well, so that there is always a back-up. For details on this see the data management plan at our website.

General guidelines for keeping a lab journal

- A lab journal should be bound (do not use a loose-leaf ring binder), preferably A4-format with a hard cover.
- Note your personal data on the cover, including name, address, and telephone number;
- Number the pages of the notebook;
- Use a pen (not a pencil) when writing;
- During the experiment, you keep a detailed account of your work, reporting everything of importance that you actually did and observed. Note this during the experiments or directly afterwards;
- Do not remove pages from the notebook;
- Start a new page for every new experiment you perform;
- Start the description of each experiment with a heading i.e. a short title and the date;
- In the first instance only use the right-hand pages of the notebook to describe the aim and set-up and to record the observations of an experiment. The elaboration of the results is also noted on the right pages. The left pages can then be used for corrections, additional notes, drawings or pictures of gels, thin-layer chromatograms, graphs made on the basis of results, etc.;
- Data from measurements should be presented in an orderly manner, for example in a Table or a Figure. Clearly indicate what quantity you use and the corresponding units. Label axes in graphs accordingly; Transfer them to excel files (according to the data management plan) as soon as possible and refer to the file and worksheet name in your lab journal.
- Use a single stroke to correct wrong observations so it can still be read. Also note if something goes wrong and why, if possible. Do not remove pages from experiments that went wrong;
- Make sure you use cross-references when you need more than one page for an experiment. Use descriptions like "continued on page "and "continuation from page ";
- Write down the aim: why is the experiment being performed; what do you want to demonstrate or prove? Add additional text if necessary so you are not confused later on. It is worth noting that you may need the results of a certain experiment again, several years later;
- If Standard Operating Procedures are available for the methods you use, you should print these and paste them into your journal and annotate accordingly.
- For other methods: Note the materials (chemicals, solutions, concentrations, apparatus etc.) and methods (set-up, conditions including temperature, adjustments of apparatus like wavelengths, method of execution). If you are conducting an experiment for the first time, make complete notes or include a clear reference to a description of a similar experiment from the literature or manual. Give sufficient details so that another person can repeat the experiment using the record in your lab journal. For instance: if you prepare a solution, write down the exact weight of the chemical, the

complete identity of the chemical, the solvent (water, ethanol?) and its volume. Make sure that any dilution steps are included.

- Write down the tentative conclusions that follow from the results and possibly a hypothesis and proposals for future research;
- Put a serial number and the initial and final dates on the cover of your notebooks when you do a large series of experiments and need more than one laboratory notebook;
- The final pages of your notebook are intended for a table of contents. Note here the page, title and date of the experiments.

Lab journal as 'organizer'

Experiments can produce all kinds of data. Many are in electronic format (data files) and no longer noted in a lab journal. It is therefore important to ensure systematic recording of these data so they can be easily retrieved later. In these cases, your notebook is used as an organizer in which you record the data file(s) that belong(s) to a certain experiment.

The following guidelines can be given:

- Separate observations, for example readings from a spectrophotometer can be noted directly in your journal;
- Data that are obtained on paper, for example printouts of spectra, can be glued in your notebook. However, if they are obtained regularly or in large quantities, it is better to store them in binders for document files. They should be sorted by date or experiment number. Make sure each print is labelled by date, type and details of the experiment, and that there is a reference to the correct page in your notebook, as well as other details and/or (visual) observations you might need later, etc. Note which plots or prints you have made and where they can be found. Mark the binders in a logical manner;
- Electronic data files are usually first produced on a hard disk of a PC coupled to the apparatus. Always store the crude data on your own computer, a memory stick or a ZIP-disk. Transfer a copy immediately to your computer, in a clear file management structure and back-up all files from your computer on a monthly basis. In the notebook you should note which files belong to which experiment and where they are saved. (See also "How to Manage Data" [1]).

[1] https://www.wur.nl/en/Research-Results/Chair-groups/Environmental-Sciences/Soil-Biology-Group/Education-2.htm under "Thesis Guide"