Guidelines for keeping a laboratory diary

It is very important in experimental work to keep a daily record of the work being performed. No matter how confident you may feel at the time, human memory is too fallible and every piece of information or idea should be entered in writing in a laboratory diary.

General Points

- As with an ordinary diary, you should **date the entry** you are making.
- The type of information required in a diary is different from that intended in a report for other people. In theory, you should be able to review the diary months or years down the line and be able to easily reacquaint yourself with the experiment and your thought processes at the time.
- Use the diary for all work and thoughts relevant to the experiment. This may include notes and salient points taken during literature reviews related to the experiment (don't forget to note down the source reference).
- **Keep the notebook reasonably neat**, you may need to make sense of it in the future. It is necessary to prevent the diary degenerating into a meaningless mass of symbols, so
    - use clear section headings as much as possible,
    - try to stick to some kind of sentence/paragraph structure.
- You should enter not only lists of observations but all aspects of description of the work. You never know what information may be subsequently needed.
- Do not scribble things down on bits of paper as these are all too easily lost, on the rare occasion that you need to include an external bit of paper (e.g., figures from manufacturers documentation), fix it in the diary securely with e.g., sellotape or glue.

Experimental Specifics

- You will require specific information such as serial numbers of meters, lengths of wires, etc., which will enable you to check calibrations if necessary, or duplicate some procedure that has worked in the past.
- Records of experimental failure are just as important as those of successful operations. This will help you to learn from the failure, identify what went wrong and make sure that you do not repeat mistakes in the future.
    - After a failed experiment, it is usually worth making some notes for future reference of what went wrong and why you think the experiment failed.
- When recording actual observations, enter them in **carefully drawn** (ideally with a ruler) **tables** clearly marked for identification.
    - All tables in a lab diary should have a title.

Calculations and Equations

- All **calculations** should also be kept **neat and orderly** and in the diary, ideally you should be able to read equations and calculations as part of a paragraph. E.g.,

  The velocity of an object falling under gravity is given by

  $$v = -gt,$$

  which can be integrated to give the position of the object as

  $$y = y_0 - \tfrac{1}{2}gt^2,$$

  where
  v is the vertical velocity,
  g is gravity,
  t is time,
  y is height,
  y_0 is initial height.

- Make sure that all notations in equations are adequately labelled (e.g., m is the mass of the projectile, v_0 is the initial velocity, ...).
- When writing down numerical quantities, remember to **include units**, and where applicable **errors** (e.g., the length of the wire is measured at 0.12 ± 0.01m).

Plotting Graphs

- Any graphs that need to be drawn should be **drawn as soon as the data is taken** (perhaps while you are carrying out the experiment) since any errors may be identified immediately and rectified.
  - If an error is identified and rectified, you may need to start a new graph when restarting the experiment.
  - Don't forget to note down the source of the error and how you rectified it.
- All graphs drawn in the lab diary should have their **axes labelled** and be **given a title**.
- Even though you may use a computer to generate your final graphs for a formal report, you must **draw them by hand first**, that is, you need to design them first.

Your diary should be clear enough for a demonstrator to read and be able to follow the work you have done. This will help demonstrators to assist you in laboratory classes, and provide a clearer lab diary for those modules where it is assessed.