

LABORATORY OR INVENTOR'S NOTEBOOK

The Notebook

A laboratory or inventor's notebook should be a detailed, witnessed record of the entire history of an invention from its first conception to its reduction to practice. The notebook should contain a carefully detailed record of all research, hypotheses, experiments, thought processes that led to the experiments, and detailed recordings of experimental procedure, supplies, and equipment, including initial analysis or interpretation of experiments and trials. Although the notebook often serves as an organizational tool and a memory aid, its most important function is in protecting any intellectual property that may be a result from the research.

Laboratory notebooks belong to the institution housing the laboratory, not the person doing the research, and generally, laboratory notebooks should not leave the laboratory.

The laboratory notebook is not a legal document, *per se*, but if properly organized and maintained, it is of considerable value, as the notebook can help establish dates of conception and reduction to practice of the invention. Large company, university, or government laboratories keep a careful watch over their research notebooks. It is of utmost importance to recognize that while most notebooks may never be called upon once they are put into storage, if needed, the notebook can make the difference between being in a position to obtain a patent for your work or not.

Purpose of the Notebook

A patent grants its owners the right to sue those who make, use, sell, or import products or services that infringe on the claims declared in the patent. Typically, governments award patents on either a first to file (most foreign countries) or first to invent (the United States of America) basis. Therefore, it is can be of utmost importance to keep and maintain records that help establish who is first to invent a particular invention. The inventor's notebook is a device for systematically recording all information related to an invention so that it can be used to develop a case during a patent contestation or patent-related lawsuit.

Not too infrequently two, or more people, simultaneously and independently conceive of and invent the same product or process. Each inventor is likely to file an application for patent based on that invention. When applications, claiming the same invention, are filed close in time an interference proceeding may be called to determine which of the patent application has a right to priority. This process is a patent law procedure that is unique to the U.S.A. Most other countries have adopted the first-to-file system. The first-to-invent system of the U.S.A. allows a party which has failed to file a patent application on time to challenge the inventorship of another party who has a granted or pending patent. A carefully kept notebook can help an inventor to establish her inventorship.

How to Keep a Notebook

Guidelines for keeping lab notebooks may vary widely between individual laboratories, but some guidelines are fairly common. Thus, to be court acceptable proof, the notebook should have bound pages, that is, the pages should be sewn or otherwise permanently attached to the spine and cover of the notebook. To ensure that data cannot be easily altered, researchers are often encouraged to write only with permanent-ink pens. Laboratory notebooks should be inspected by an experienced member of the laboratory on a regular basis. The notebook may be elaborate in that it offers a permanently bound set of pages, the means to make an original and a copy of each page, and the means to remove the page copies. Ideally, data are entered into a notebook as the experiment progresses, on a daily basis if need be. Annotations should be added to provide extra credibility for the entry. For example, an entry could be annotated with the time, ambient temperature, and humidity measure in the laboratory. Such an entry could explain why a sample took an exceptional amount of time to dry and it also could be used to verify that the entry was made on the specified date.

Each page of the notebook should be twice signed and dated, once by the experimenter and once by a competent witness. Items may be stapled, taped, or glued onto a notebook page, but then each added entry also must be signed and dated by both the experimenter and the witness. This must be done so that a part of

each signature and date is on the attached material and part on the page onto which the material has been attached. These details are important if the notebook is to be used as court-acceptable proof. Each notebook page should be numbered. No numbered page should be missing. All pages should be filled in or marked in such a way that material may not be added after the fact, such as by putting a large cross mark across an empty space on a page. Initially, leaving a few blank pages at the beginning for a Table of Contents can save much time later on when a particular experiment has to be reviewed. Usually, when a notebook has been entirely filled, or a project comes to an end, the experimenter keeps the removable page copies for his record and the person responsible for the company, university, or government laboratory documents reviews the permanently bound set of pages to make sure the notebook is in a legally acceptable form, makes a record of the book, and then puts it into secure storage. The notebook, however, may just as well be a simple, composition book – the inexpensive notebook that has sewn-in pages. If data is recorded and witnessed completely and correctly, either type of notebook can provide the court-acceptable proof that will be needed if the inventive process should come into question.

If photographs of the experiment are to be used as part of the notebook, it is advised to use film photographs as digital photographs can be problematic for use in court proceedings.

Content of the Laboratory Notebook

Each entry in the Table of Contents should include the title of the experiment, the date, and the page number of the entry. The laboratory notebook must answer the following questions.

WHAT WAS DONE? This includes the approach to the problem or project, as well as the experimental procedure. If tests are conducted on some device, clearly identify that device and give characteristics. Include detailed explanation of materials and methods, protocol, reference to related experiments, calculation, any experimental amendments.

WHO DID IT? List all members of the lab group, including yourself, at the beginning of the write-up.

WHEN WAS IT DONE? It must be obvious to you or any reader when the experimental work was performed. Date all entries in the notebook. It is possible that a single experiment may have 2 or 3 different dates. Do not leave blank spaces and never "back-date" notebook entries.

WHAT WERE THE RESULTS? Data must be distinguished from calculated values. It should be obvious which measuring instrument yielded which data. Examples of each type of calculation must be given. Graphs must have titles, labels and scales are required for each axis. Do not "freehand" curves. The observation and result data should include everything that happens during the experiment, including everything that was expected or anticipated and did not.

WHAT DOES IT MEAN? The experimental observations should conclude with a discussion and conclusion. The results obtained and implications of the data should be discussed. In the conclusion, remarks may be made on the experiment in general and what is the logical next step. Be precise and concise. Compare your results to the theoretical (give reference). Specifically why do you believe or disbelieve the results? Discuss errors relative to the accuracy of the measurement equipment.

All writing that will facilitate data entry should be planned out in advance. Results may include: tables, charts, graphs, printouts, pictures, gels, films, and calculations.

There are many reasons to keep an accurate and complete record of experimental work. Among these are being able to establish the authenticity of the work, defend resulting patents, serve as a basis for technical reports and articles, avoid duplication of effort, and to avoid repetition of erroneous procedures. Your laboratory notebooks MUST contain all the information that would be required for you or someone else to completely reproduce your experiment.

Maintaining the Notebook

Record all observations as soon as possible. Check weekly to make sure that all data/printout/films are attached in a timely manner, that all required tables and graphs

are created, and entered. Draft a "Summary for the Past Week", make plan for the following week, and record all experiments in the Table of Contents.

Electronic Notebooks

Several companies now offer electronic laboratory notebooks. This format has gained some popularity, especially in large pharmaceutical companies, which have large numbers of researchers and great need to document their experiments. A virtual inventor's notebook, in which the inventor scans note pages and emails them to oneself, might provide the same patent contestation protection and the same chronological record, and would be less likely to be lost or stolen. However, the confidentiality of this method should be carefully ascertained beforehand. Moreover, as digital copies are no longer allowed for evidentiary purposes in trial situations, it might be better to keep paper copies rather than electronic.