Part I Writing the First Draft: Format
Chapter 1  Getting Started

Facing the task

Your first science lab report may seem a daunting task. Whether it’s a three-hour lab or field exercise, or an independent research experiment that you have to write up, there are some new skills that you need. Science reports have a format which you must follow. You need to know how to present and interpret data. You must learn to use scientific style in your reports.

This book is your guide to developing the specific skills you need out of your general background in writing. Our goal is to start you writing science. Successful Lab Reports bridges the gap between the many books about writing term papers on the one hand, and the advanced books about writing papers for publication in scientific journals on the other hand. Neither of those groups of books gives much information on science lab reports. The chapters in Part I of this book can be used as a tool to help you draft your first report by taking you through the structure of a report. Part II shows you how to revise your paper and refine your scientific style; these are skills you will continue to practice as you write more reports.

Writing a science lab report is not difficult.

No matter whether your experiment went smoothly or seemed chaotic, you can write a good report. Just follow the
Part I: Format

practical advice in this guidebook. Your grade will probably depend on how well you show that you understand the experiment and how well you write your report using scientific format and style. As you organize your thoughts and data for the report and write simple, clear sentences, you will come to a clearer understanding of the experiment.

Writing for science classes

A lab report is neither a term paper nor a scientific paper. You do not have to read and summarize a large number of books and papers in the library; your report needs only a small amount of background information to give context to your own experiments or observations. On the other hand, while a lab report must have the structure of a scientific paper, it has a different audience and purpose. Your lab report is written to your professor, who already knows all about the work, to show that you understand the process and significance of the experiment. In contrast, a scientific paper is written to fellow scientists to present and discuss new information and ideas.

Good scientific writing is not literary, in spite of the fact that scientists use literature as a generic term for their writings. You do not have to be a masterful creative writer to write an excellent lab report! Rather, you need to use straightforward words and clear sentences that unambiguously convey your meaning. The format of a scientific paper already gives you an outline for your report and should get you past the writer’s block that can come from staring at a blank page with no idea of what to write.

Structure: the IMRAD formula

The plan of a scientific paper, and so of your report is this:

Title and Author(s)
[Abstract]
Part I: Format

Introduction
Materials and Methods (or Experimental)
Results
Discussion
References (or Literature Cited)
Figures and Tables

The core of this plan is Introduction-Methods-Results-and-Discussion, known as IMRAD by those who like acronyms. This structure arose from the more narrative style of the last century because it helps ever-busier readers find the parts they want.

Read any instructions from your professor!

While the overall IMRAD plan is generally agreed on, writing style is ultimately a matter of individual opinion. Find out what your professor wants. We will indicate by [Ask!] in the following chapters where there are divergent opinions on points of style.

The fact that a paper is presented in the order given above doesn’t mean that you have to write it in that order. In fact, if you have difficulty starting with the Introduction, we recommend that you try starting with the Methods. The Introduction is more difficult to write because you have so many ways to begin; in this section, a science report is most like a composition. The Methods section consists simply of factual statements of what you did. You can use the next few chapters in whatever order you need, but we suggest you read the whole of Part I – on writing the first draft – to get an overview of what you’ll be doing. Then re-read each chapter before you begin to write that section. Also, outlining each of your sections will help you to organize your ideas. Writing a lab report is like putting together a jigsaw puzzle: you have to put all the facts and ideas in order, so that they make a clear picture.
THIS IS RAMBLE HE KILLS WITH CONFUSION

FUNNY HE DOESN'T LOOK LIKE A DRAFT DODGER

RAT TA TA TA TA
Part I: Format

Outlining

The Introduction and the Discussion do not have much structure imposed by the work. Therefore you must create the structure yourself by preparing an outline. This is very important if you are to avoid rambling. The outline will enable you to create text that is easier for you to write and easier for the reader to follow. Even the more structured sections are easier to write if you first outline them. If you begin writing without an outline and later wish you had one, you can create one from the writing: outline what you wrote to see what you need.

If you use separate pages for each of the sections, you can go back and forth, just brainstorming ideas. When your lists seem complete, organize the ideas. Number the ideas in an order you think will lead the reader clearly from one idea to the next. Any logical sequence of ideas is good; there is no one ‘right’ or ‘best’ way to organize a section. Rewrite the lists in order, so you can scan over the structure of each section and think about the flow of ideas. You will probably change the order as you write or when you revise, so there is no need to belabor it in the outline.

Getting started

As you prepare to write, keep one important point in mind: your first draft does not have to be just right, or look pretty. Only you will see this draft – just make sure you will be able to read it later. If you are handwriting, double space and leave wide margins so you have plenty of room for afterthoughts. Don’t worry about just the right word or phrase in the first draft; don’t bother to check spelling yet, or fix typographic errors. Write – and keep writing! This is a draft and you will revise and proofread it before you hand it in.
Chapter 2  Introduction

Purpose of the Introduction
The Introduction gives the background to the work, starting with the broad context of the study and leading up to the hypothesis – the question studied, or the pattern sought. One way of thinking about the Introduction is as a series of questions relating to why the study is interesting:

How is the organism or process important?
Why was this organism chosen?
(Convenient to handle? Important ‘bug’? Good model system for process under study?)
What methods are available for this study?
Why was your particular method chosen?
What is known to date about the process, especially in this organism?
What question was tested?

The hypothesis
What is the hypothesis? It is a formal statement about nature which can be tested. For example: ‘Respiration rate is affected by (is a function of) temperature.’ There is a null hypothesis, the opposite, which in this case is, ‘Respiration is not a function of temperature.’ Or, an ecological example, ‘The distribution
2.976,315...2.976,316...2.976-----!!

WHY ARE YOU DOING THAT, MR. CRUSOE?

NOT MUCH ELSE TO DO ON A DESERT ISLAND, MR. DARWIN.