

Preface

As a biologist who also teaches composition, I see many students who have strong backgrounds in biology but still struggle with the writing tasks and challenges unique to their discipline. Biologists need to think creatively about science, and they need to write about science clearly, accurately, and concisely. In fact, these two processes, thinking and writing, are as interdependent in science as they are in any other field. Unfortunately it is difficult to fit any extensive discussion of scientific writing into a regular semester-long biology course. I continue to hope this book can substitute for such discussion, serving as a supplemental text for courses requiring laboratory reports or longer written assignments. Although intended primarily for undergraduates who need an introduction to the aims and format of biological writing, it will also be useful for more experienced students, including master's and doctoral candidates who are preparing dissertations or manuscripts for publication. Finally, I hope this book will also find its place in the small but growing number of courses on scientific writing at the undergraduate or graduate level.

Like its three predecessors, the fourth edition is organized as a self-help manual, offering straightforward solutions to common problems and numerous examples of both faulty and effective writing. All of the book's most important features—rules highlighted with bullets, numerous examples, clear and concise explanations, and a detailed index—have been retained, including the spiral binding for easier use. The fourth edition includes expanded discussions of many topics as well as much new material.

The Introduction discusses the role of both formal and informal writing in biology and gives an overview of the diversity of writing tasks faced by professional biologists. Chapter 1, a detailed guide to locating and using biological literature, has been thoroughly revised to address the ever-changing parameters of electronic research. Coverage includes guidelines for conducting online searches, updated descriptions of a wide variety of scientific databases, and an enlarged section on evaluating Internet sources. Sections on how to read scientific papers, how to take good notes, and how to avoid plagiarism—always of concern to students—have been retained.

Chapters 2 and 3, which introduce students to handling, analyzing, and presenting data, have been enlarged and updated. Both chapters still include advice on experimental design and the use of statistics both in writing and in research.

Chapters 4 and 5 discuss the three types of writing assignments most commonly faced by biology students. Chapter 4 focuses on the *research*

paper, the primary form in which professional biologists communicate original findings. Students are expected to follow this model when they prepare research projects or laboratory and field reports. In addition to an updated sample research paper, Chapter 4 includes an example of a student *lab report* as well. Chapter 5 discusses the *review paper*, which resembles the library-oriented “term paper” assignments of advanced courses. The sample paper in this chapter has also been revised.

Students often get confused about how to use literature citations and how to prepare the Literature Cited section of their papers. Chapter 6 discusses the Council of Science Editors (CSE) documentation format, including guidelines for handling electronic sources. This section has been enlarged and updated to reflect changes likely to appear in the forthcoming seventh edition of the CSE style manual. CSE format is illustrated by each of the sample papers in Chapters 4 and 5, as well as the sample research proposal in Chapter 10. New to the fourth edition is a section on APA style, the documentation system recommended by the American Psychological Association and used in psychology and other behavioral and social sciences.

Many students are uncertain about how to begin a paper or how to revise it effectively. Chapter 7 discusses the process of drafting and revising and presents the basics of each stage of the writing process—from brainstorming to composing the first draft, to final editing at the paragraph and sentence levels. To help students prepare their final drafts, Chapter 8 discusses manuscript format, provides proofreading strategies, explains how to write an Acknowledgments section, and lists symbols and abbreviations commonly used in biology.

Students often underestimate the role that writing can play in learning difficult material and in studying for examinations. Chapter 9 offers strategies for taking notes, making laboratory drawings, getting the most out of textbooks, studying for short-answer questions, and preparing for laboratory exams. Examples of poor and improved essay examination questions have been added.

Finally, the fourth edition includes updated coverage of other forms of biological writing often faced by biology students. Chapter 10 presents strategies for preparing research proposals, letters of application, résumés, curricula vitae, and both oral and poster presentations. Examples from the third edition have been updated, and both a sample PowerPoint presentation and a sample student poster have been added.

Throughout the book I have tried to address the special demands and challenges of academic assignments in the context of how and why professional biologists write. I hope this handbook will convince students that scientific writing, including their own, need not be tedious and cumbersome, but can be clear, crisp, incisive, and engaging.

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