General scientific writing

Articles:
- The Science of Scientific Writing: Judith Swan's article about structuring sentences to make them clear and to help readers follow your logic
- Scitable (from Nature Education) guide to effective writing: explains how to structure sentences so that their message is clear and when to use passive voice and when not to

Webinar/videos:
- BiteSize Bio has several webinars on communication and writing.

Online book:
- Nature Education (Scitable) offers English communication for scientists, written by a French engineer who has given workshops on this topic for years. It covers general communication, manuscripts, and presentations, and includes multiple-choice tests.

Nuts and Bolts Guide to College Writing:
- Excellent explanation of how to plan and connect paragraphs
- Thorough discussion of style: clarity, concision, and rhetorical techniques
- The Elements of Style: online version of the classic guide to composition

Handouts:
- Vanderbilt Writing Studio's handouts (especially useful: Writing anxiety, Revision, and Clarifying long, complicated sentences)
- Boise State University handout on coherence: similar message to Swan article, but more straightforward

Column/series:
- Grammar Girl: covers all sorts of grammar issues, includes a search function, explains rules and the exceptions to them

Forums:
- If you have a specific question, try asking the users of the "Paper and Grant Writing, Publishing and Presentation" board on BioForum. Questions are usually answered within a day.

Writing research articles

Textbook: Essentials of Writing Biomedical Research Papers
- Very comprehensive; covers building blocks (word choice, sentences, paragraphs) and what each section should say and do
Includes revision exercises in each chapter, with suggested answers at the back of the book
Several copies available in the CSC office

Guides:
UCSF's Office of Career and Professional Development's section-by-section guide to papers included samples and how-to handouts. Excellent for getting started on your first paper.

Scitable (from Nature Education) has a similarly useful guide with examples to follow (even a revision!)

Columbia University undergraduate biology's guide: bare-bones description of what each section should do (especially clear explanation of discussions)

SciDev.net's practical guide, "How do I write a scientific paper?": briefly explains the purposes of each section and describes the features of well-written papers, has good points about methods, references, and tables

Articles:
ScienceCareers articles: there are tons on paper writing-- search the "Career Advice" section for those keywords (or something more specific), but here's a sampling:
Tips for Publishing in Scientific Journals (written by a Science editor)
Writing Science: The Story's the Thing
How to Get Around to Writing
Writing a Publishable Journal Article (checklist to ensure your paper focuses on the main point, from a journal copyeditor)

BiteSize Bio has a couple of very helpful things:
The article series, "Writing you first (or next) paper": explains each step of composing a paper, with good consideration of working with your mentor
Eight steps to a well-written manuscript boils down a paper into eight key questions

Nature editors' editorials on writing clear, engaging papers:
"Elements of style": emphasizes the importance of story
"Writing a clear and engaging paper for all astronomers": emphasizes saying what you mean

The journal Clinical Chemistry's guide to scientific writing (a series of articles written by a professor of Pathology at U. Mich.) provides arguments for writing each section of a manuscript a particular way. His suggestions are similar to those in the lessons here since he also relies heavily on the Zeiger textbook, but he adds some useful analogies.
**Writing proposals**

Most resources here (except the NIH itself) describe the old NIH format. The new one has no Background section and instead includes Significance and Innovation subsections within the Research Strategy.

Two books on science grant proposals are equally well-reviewed:
- **Writing Successful Science Proposals**-- includes exercises, also covers selecting funding sources and resubmitting
- **Guide to Effective Grant Writing**-- NIH-focused, emphasizes clarity and telling a story

NIH resources:
- Tips for **writing your application**-- some suggestions are vague and others are about minor details, but this does give you an idea of what the institution itself believes is important to a good grant
  - **Video** about how grant review works, which may help you understand your audience and their needs.

UCSF's OCPD has a **handout** (pdf) from a workshop on grant writing that includes lots of examples (not annotated, though) and resources.

**Articles:**
- ScienceCareers has hundreds of articles on this topic as well, from general to funding-source-specific. Here are some that seem especially useful:
  - The GrantDoctor's "**How to get a grant**" (the GrantDoctor is a regular column, and covers mostly non-writing concerns)
  - **How not to kill a grant application** series
  - **NIH R01 toolkit** (see especially items 18-21 and 23)
  - TheScientist article: "**Ten ways to write a better grant**"

**Figure design**

Books (available in the Vanderbilt Science Library; links are to Amazon pages):
The works of Edward Tufte provide simple guidelines for creating figures that help readers see what you want them to, and that look clean and simple. **The Visual Display of Quantitative Information** is the first and most popular, and contain his most influential ideas (e.g. the data-ink ratio).

However, the biostatistics department prefers William Cleveland's textbook **The Elements of Graphing Data**. This book is especially useful for determining how to display large amounts of data both accurately and clearly.
Other resources:
Bang Wong, the creative director at the Broad Institute of MIT and Harvard, writes a column in Nature Methods about how human interpretation of images affects figure design called [Points of View](link to first column).

Edward Tufte's website includes an active, searchable [discussion board](discussion board)