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# PLANNING, DRAFTING, AND EDITING DOCUMENTS

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*Frank Barone: “Luck” is the residue of good planning.  
—“Everybody Loves Raymond” (1996)*

## 5.1 IN THIS CHAPTER

Documents, regardless of type, take work to prepare. The actual “writing” of a proposal, report, or journal article represents the product of a great deal of work that occurs prior to touching the keyboard. At the root of this chapter lies the assumption that all writing is “rhetorical,” meaning that it has a specific purpose and a specific audience, fits within certain disciplinary conventions, and conforms to quality technical English. This chapter also takes it for granted that writing occurs in a series of interwoven steps, and moves through several phases that cycle back on one another. Figure 5.1 provides a visual representation of how we conceive of this rhetorical, recursive process.

It’s important to note that the process outlined in Figure 5.1 represents a synthesis of many different formulations of the writing process. Scores of people have written books, articles, and websites about their approach to an effective writing process and

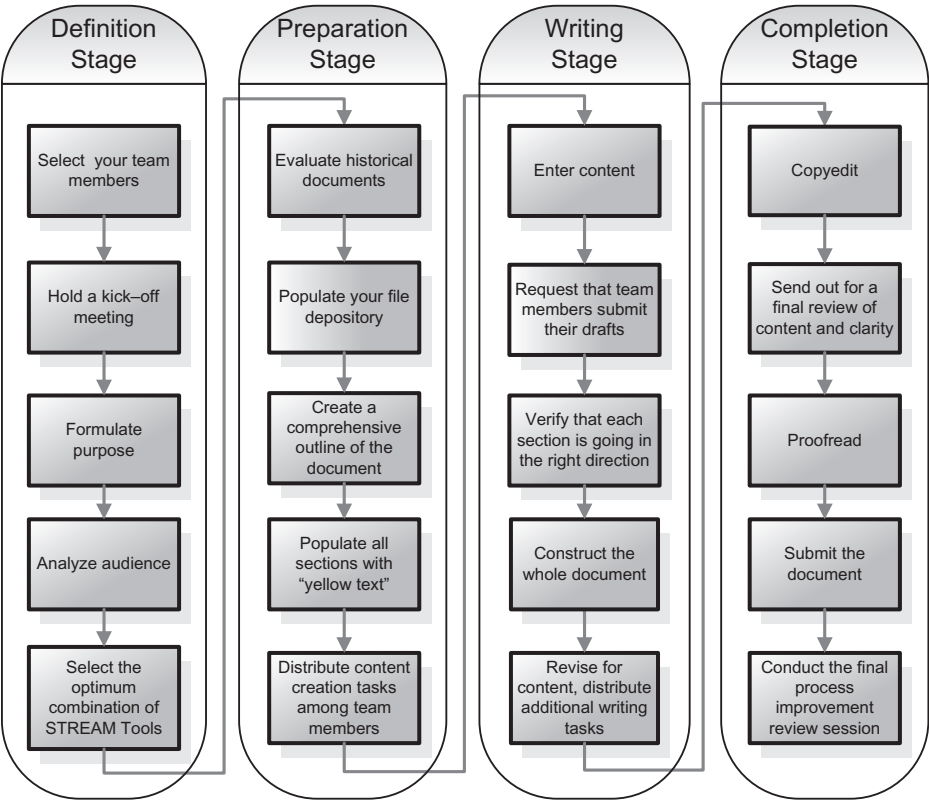
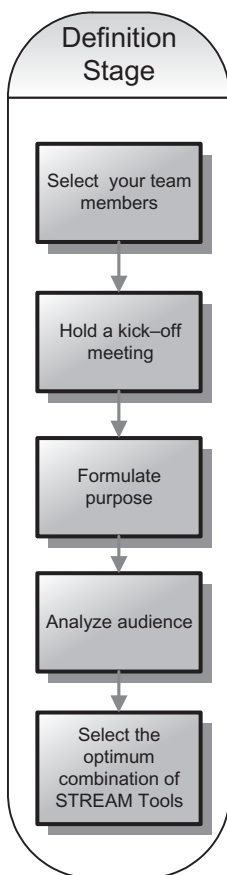


Figure 5.1. The *STREAM Tools* writing process

divided those processes into infinitely complex stages and steps. This chapter takes a more systematic—and somewhat easier to follow—approach by synthesizing these multiple methods into four primary stages that apply across all writing models and textbooks as the best means for communicating your research results, ideas, and arguments. These four major stages are further subdivided into minor steps as a sort of checklist for your writing team. Again, we’d like to emphasize that your team should not view the writing process as completely linear; all experienced writers know that they must cycle back through prior stages as they progress. For example, your first revision in the final step of the “Writing Stage” will quite likely reveal holes in the text that must be addressed. As a consequence of that discovery, your team might need to move back into the “Preparation Stage” so that the team can alter the document outline and assign the new writing tasks that follow. If Figure 5.1 were drawn to represent all possible revision cycles, it would look like a bowl of spaghetti. Accordingly, we’ve chosen to visually represent an idealized process, knowing that all writing projects cycle and then recycle through multiple stages of the process.

## 5.2 DEFINITION STAGE



One of the most obvious, yet rarely discussed, components of writing is deciding whether or not a document should be written at all. Is this proposal very likely to be rejected for reasons outside of your control? Is the journal you selected considered the most prestigious in your field? Most likely, this will be a management decision that will be communicated to others who will then execute the actual writing process. Assuming that your organization has decided that it will move forward with composing a certain document, the first stage is to define the scope of the project. Defining the scope, however, first requires compiling the team that will create the document since their participation will be crucial. Once the team is in place, you'll need to hold a formal kick-off meeting to articulate the purpose and audience of your documents and then select which *STREAM Tools* to use. Much like an initial specifications document for any product, the work done in the definition stage determines the overall strategy of the document without specifying the ways that those strategies will be realized in the actual manuscript. The following sections detail each of the steps for establishing document definition.

### 5.2.1 Select Your Team Members

You need to match knowledge, skills, and availability of your team to the upcoming tasks in creating the document. Do not necessarily limit yourself to the immediate group with which you are working. Perhaps you need to contract the services of a graphic designer for a few key visuals, have a very senior person review the abstract, or enlist the services of the IT department to set up your file management system. Perhaps you need a *STREAM Tools* expert to guide you and make sure that all team members are comfortable with Microsoft Word and your chosen document-sharing plan. Regardless, the team should be constructed of those individuals who are most capable of contributing to the final document, even if those individuals are not necessarily in your immediate group.

As you build your team, beware of constructing representative teams. Often teams fail when individuals are selected for a project based upon their title or position in the organization rather than the skills they can bring. If your management or research leader has mandated that your team must be representative, research the background of individuals in the group and try to select the person most likely to meet your needs *and* represent their area. Sometimes, of course, representative teams work, but most often they fail because, like politicians who represent different states or districts, the representatives end up squabbling over turf rather than moving the writing project forward. If possible, simply try to avoid representative teams.

Obviously, team selection is one of the most important factors in writing successful manuscripts. We have dedicated all of Chapter 6, “Building High Quality Writing Teams,” to discussing the particulars of working in teams. We encourage you to familiarize yourself and your team members with Chapter 6 if collaborative writing is a new adventure for your group.

### 5.2.2 Hold a Kick-off Meeting

Generally speaking, meetings are evil. But avoiding meetings completely is a road to disaster, because a team accomplishes much more than just work at a kick-off meeting. The most important reason to hold a kick-off meeting, even if it is the only meeting you hold for the duration of the project, is to allow your team members to begin to build rapport with one another as they come to learn about their peers and share their unique qualifications for the project. The kick-off meeting should be structured in a way that provides opportunity for socializing so that the team members forge relationships that will—to the greatest extent possible—promote cohesion in the team.

***STREAM Tools Commandment #6:***

Do not assume that others know what you expect them to know.

Of course, a kick-off meeting cannot be all fun since serious work needs to be accomplished. For example, the remaining steps of the definition stage should be brainstormed and discussed at this kick-off meeting so that all team members are aware of the methods you will be using to author the document, the purposes of the document, the document’s audience, and the timeline for producing the manuscript. If the team members share an understanding of the project scope and have had an opportunity to contribute to formulating the scope, then the team is likely to become productive very quickly. The more differences you can work out at the beginning of a project, the better your team will be. Why wait until halfway through to learn that one author has written for experts and one has written for a general audience because each had a different understanding of the document’s purpose?

Because the kick-off meeting is so crucial for future productivity, even if your team cannot meet in person, you should still have a “virtual” kick-off meeting that covers roughly the same topics. You might need to hold several shorter meetings since people’s attention wanes on conference calls or web-based interactions, but you still want to have all the team members share as much understanding of the project as possible. In Section 6.4 of this book, we discuss in depth many ways that you can build successful virtual teams. If your team will be working virtually—and in today’s workplace, it’s highly likely at least some team members will work remotely at least some of the time—we encourage you to study Section 6.4 for hints.

### 5.2.3 Analyze the Audience

At your kick-off meeting, your team should come to an understanding not only about how they’ll collaborate, but also about their audience. If your team members share an

understanding about the major audience and that audience's characteristics, then deciding on other things such as content and style becomes immensely easier. Additionally, when team members share the same vision of the audience, revision time can be reduced since all authors will have been writing to the same "person."

Generally, documents are written for one of five audience types:

- General readers
- Managers and decision makers
- Technicians
- Operators
- Experts

Each of these audience types has specific knowledge, beliefs, needs, expectations, and ways of acting on documents. To be effective, your document should anticipate—and clearly address—these audience expectations. Often, it's helpful to conceptualize your audience as a "persona," a figure with a name that embodies the general characteristics of your audience: their education levels, their biases, and their reasons for reading the document. Your team creates a "picture" of a person by brainstorming the audience's characteristics, then combining them all under a name—say "Brian." The character "Brian" then comes to represent the audience and all people are working with the same image (and sometimes teams even use a photograph of a person to make it more "real"). Software development teams are very familiar with this concept of creating "personas."

The documents you prepare could, in principle, be written for any number of audiences since most documents have secondary and tertiary audiences. However, of the audiences types referenced in Table 5.1, writers of technical document will most likely be writing for experts and managers/decision makers (or a combination of decision makers who are also experts). Use the characteristics outlined in Table 5.1 to seed your team's conversation about what kind of person Brian really is.

In practice, of course, these audience types bleed across the boundaries, but meeting the needs of one audience type usually takes precedence over the others. This is your **PRIMARY AUDIENCE** and this group represents the people who can help you achieve the purpose you've established for your document. Additional readers are called the **SECONDARY AUDIENCE** and might include gatekeepers who transmit the document or those who receive the document as reference material but do not act on the purposes of the document. Another type of audience is the **TERTIARY AUDIENCE**, and might be people who have a passing interest in the document but have no direct influence on the outcomes it desires. You can imagine this audience as individuals who might simply like to know what's going on.

As a result of articulating the specific nature of your audience, the team should agree on—and probably even memorize—a short statement that follows the suggestions in the *STREAM Tools* Audience Assessment Tool.

TABLE 5.1. Five Audiences and How to Write for Them<sup>1</sup>

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General Reader

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*Definition:* Readers outside of their particular field of specialization.

*Characteristics:* Typically read for enjoyment and have little prior knowledge on the topic so this is NOT a “captive” audience.

***Writing Strategies:***

Content: Topics that relate to their daily lives; writing must include ample background information, usually in summary form rather than detail; give practical information rather than theory; provide extended definitions; use anecdotes and other human interest information.

Organization: Employs narrative, chronological form; moves from least complex to most complex, from most interesting to least interesting, and from general to specific.

Style: Informal; uses plain language, few technical terms, and no jargon.

Design: Includes lots of white space, color, and eye-catching graphics including simple charts, maps, bar graphs, and photos.

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Managers and Decision Makers

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*Definition:* Readers responsible for decisions regarding personnel, production, or profits.

*Characteristics:* Interested in effects and costs rather than in theory or mechanical applications. These readers may have broad knowledge of the field but are not involved in technical work.

***Writing Strategies:***

Content: Includes concise background information; makes recommendations based on data and includes non-essential data and information in an appendix.

Organization: Deductive reasoning is used with the most important information at the beginning.

Style: Formal but readable and in plain language; includes verbal explanations of data.

Design: Uses headings and white space for easy access to data; includes graphics such as pie charts, bar graphs, simple line graphs, and tables.

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Expert

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*Definition:* Readers trained in the theory and probably the applications of a specific field.

*Characteristics:* Looking for new information; desire to evaluate the content that is presented in order to apply or expand their knowledge; this is a captive audience.

***Writing Strategies:***

Content: Includes detailed background information that evolves from theory and leads to practical applications; research methods must be outlined in sufficient detail for replication; authors must draw conclusions from the data.

Organization: Reasoning is inductive with the narrative moving from specific to general content; must include conclusions and recommendations at the end; adheres to typical scientific report form.

Style: Formal and objective with standard terms, abbreviations, and technical formulae or equations; longer, more complex sentences and paragraphs.

Design: There is little need for white space but this reader requires excellent headings and a format that includes more complex tables, line graphs, charts, and illustrations.

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TABLE 5.1. *Continued*

Technician

*Definition:* Readers trained to build and maintain specialized equipment.

*Characteristics:* Interested in *how* equipment works and not in theoretical experimentation or explanation.

***Writing Strategies:***

Content: Includes a general description of equipment, parts, operating principles, and maintenance; emphasizes details for troubleshooting rather than theoretical background.

Organization: Ideas are presented sequentially or chronologically.

Style: Uses active voice with standard terms and abbreviations but few definitions; verbal explanations accompany visuals in short sentences and paragraphs.

Design: Includes carefully-labeled drawings and descriptive headings surrounded by plenty of white space; shows numbered steps with colorful charts, graphs and photographs.

Operator

*Definition:* Readers responsible for actual operation of equipment.

*Characteristics:* Interested in *how* equipment works and not in explanations of why it works.

***Writing Strategies:***

Content: Emphasizes mechanical operation; includes detailed operating instructions.

Organization: Ideas are presented sequentially or chronologically.

Style: Uses active voice and imperative mood with no formulas or equations; sentences and paragraphs are short and precise.

Design: Uses lots of white space surrounding numbered steps, illustrations, and photos; employs blow-up diagrams in order to explain operation; includes warnings and cautions set off by lines, boxes, and colors.

<sup>1</sup>This table adapts the work of Carolyn Plumb, Director of Educational Innovation and Strategic Projects at Montana State University.

**The *STREAM* Tools Audience Assessment Tool**

Our audience is \_\_\_\_\_

who know \_\_\_\_\_,

who believe \_\_\_\_\_,

who expect \_\_\_\_\_

and will use this document to \_\_\_\_\_.

### 5.2.4 Formulate the Purpose

A third agenda item for your kick-off meeting is to build understanding about the document's purpose: what does your team (or organization) expect to achieve by communicating to a specific audience? What do you *want* from *them*? This is the document's purpose. In technical writing, there can be many purposes—to persuade, to inform, and to instruct—and often those purposes overlap just as audience types overlap. However, just as a team must identify their primary audience to produce effective documents, the primary purpose must be decided prior to constructing the document. *In short, begin with the end in mind.* At the end of the process, if your team had its way, what would happen after the audience read the document? Would the audience fund your project? Would the audience agree with your interpretation of data? Would the audience complete the task? Each of these purposes—persuasion, exposition, and instruction—require different approaches to writing.

**5.2.4.1 Persuasion.** In its simplest form, *persuasion* is about *change*, changing what others think, what they do, and what they believe. Persuasion is often confused with “argument,” but technically speaking, they are not the same. “Argument” refers to the structure of writing and the logic behind the presentation. Persuasion, when presented in a quality argumentative form, drives an audience to see things in a new way. Said another way, persuasion is the goal and argument is the method. Some common examples of persuasive texts in technical contexts are:

- grant proposals (persuading evaluators to fund your project);
- process change proposals (persuading others to alter operations);
- recommendation reports (persuading readers to assume a certain course of action);
- journal articles and technical papers (persuading readers that your interpretation/application of data is correct or solves the problem posed).

**5.2.4.2 Exposition.** The primary concern of expository writing is presenting information in such a way that others can draw their own conclusions. Technical writers will be familiar with exposition because it's about painting a picture of what happened: what did you see, hear, and touch? What did the machine do before it broke? How did two chemicals react when combined with a third? Exposition, when done well, enables readers of a document to visualize what the document expresses. Consequently, that audience builds a common understanding with the document's authors about the point under discussion. Quality exposition requires careful descriptions, precise definitions, and thorough coverage of relevant data because the purpose of exposition is to enable readers to feel confident about their understanding of a topic. Common examples of expository texts in technical contexts are:

- manufacturer's safety data sheets
- the “Results” section of a report or journal article
- incident reports

**5.2.4.3 Instruction.** Documents that instruct are easy to identify by their focus on procedures, stages, steps, and imperative tone. Composing instructions or manuals



assumes that the team of writers possesses more knowledge about a process than a target audience does. As a consequence of this level of superior understanding, instructing others requires writers to assess carefully the technicality of their instructions to ensure that they are appropriate for the target audience. Quite often, those who instruct forget that the reason for composing a set of instructions is precisely that others *do not* have the same level of knowledge. While “dumbing down” a process might seem like the logical thing to do, writers who hope to instruct really should begin with the assumption that the audience can learn the material if authors present it well. The burden is on the writers—not the readers—to describe processes or explain details of procedures or outline consequences of actions in a clear manner. This approach is called “reader-based prose” because it assumes that a document has been prepared to lessen the burden on the reader and that, if a reader isn’t able to duplicate the process, it is the document’s fault—not the reader’s. Some common examples of instruction in technical contexts include:

- the methods sections of lab reports or journal articles;
- process descriptions of safety procedures;
- installation manuals;
- usage guides and handbooks.

In reality, nearly all documents contain some element of each of these three purposes, just as most documents are written with multiple audiences in mind. For example, a grant proposal clearly attempts to persuade the reviewers, but its success relies on careful exposition of the problem as well as a precise description of the processes and methods proposed to address the problem. Likewise, journal articles usually include a section that describes a problem, outlines a process used to study the problem, presents precise findings, and attempts to persuade readers that the author’s conclusions logically evolve from the findings.

Even though multiple purposes might exist, your team should still settle on one single, primary purpose that all team members understand and agree upon. To help keep the purpose clearly in mind, your team might compose a statement using the *STREAM Tools Purpose Tool*.

**The *STREAM Tools* Purpose Tool**

*Our purpose is to* \_\_\_\_\_  
*our audience that* \_\_\_\_\_,  
*so that they will* \_\_\_\_\_  
*after reviewing our document.*

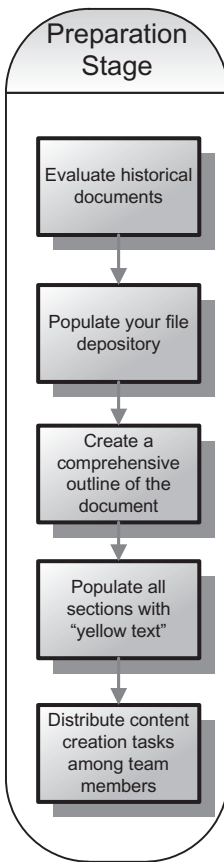
### 5.2.5 Select the Optimum Combination of *STREAM Tools*

As a final step in your definition, your team should select a combination of *STREAM Tools* that will be most suitable for the project. The goal is to strike a balance between tools that are more efficient but complex and tools that are simple but less efficient. Remember that the components of *STREAM Tools* are modular; you need only learn the processes that are relevant to your particular project, and each tool addresses particular challenges. You can refer to Figure 1.1 to remind yourself of the three main components of *STREAM Tools*—Writing Quality, Document Design, and File Management—and the problems they aim to solve. Additionally, the chapters in this book align with each of the major modules: Chapter 7, for example, addresses Writing Quality, Chapter 3 addresses Document Design, and Chapter 6 addresses File Management among collaborators.

A few examples will help to demonstrate how to select *STREAM Tools* that are appropriate for your team, based upon this modular approach. For example, if the team will only generate a couple of figures for the manuscript, teaching everyone all the complexities of auto-numbering would be excessive when it would be faster to integrate the figures without cross-referencing. Conversely, if multiple authors will submit a sizeable chapter for inclusion in a long report, it makes perfect sense for you to distribute a fully formed *STREAM Tools* template to all co-authors and show them how to use all the features including auto-numbering. It would also be appropriate to determine ahead of time which collaborative technologies your team will use: email, SharePoint, a wiki, or another file exchange system. If you expect only one or two iterations, email may suffice, but if you expect 10–15 iterations, your team will need a shared file space. You will also need to consider who is on your team and what technologies they can access. While it might suffice for your internal team to use SharePoint, authors outside of your organization wouldn't have access. Consequently, you'll need to establish another mechanism such as a wiki like those offered for free by PBWorks.com.

## 5.3 PREPARATION STAGE

While the definition stage helps you create the scope of the document and build understanding among your team members about the document's audience and purpose, the preparation stage actually moves your team toward authoring the content. As your team prepares to write, a few key questions remain: What do we know about this type of document? What files do we already possess that we could mine for content? How should we organize the document? What content do we already know we will need to create from scratch? Finally, who is going to take accountability for actually composing each part of the document, and on what timeline? In the preparation stage, your team will address these concerns by analyzing documents from the group's past archives, populating your file repository, creating a comprehensive document outline, populating your outline with "yellow text"—a sort of placeholder—and finally by distributing the actual tasks to team members or groups. We will discuss each of these steps in the following section.



### 5.3.1 Evaluate Historical Documents

To paraphrase the title of an article by Lee Clark Johns, “the file cabinet has a sex life.” In other words, documents that live in the file cabinet often reproduce themselves as writers look for models. Just about every company, research group, or individual has a “file cabinet” of sorts that they examine for possible ways to structure their documents. In fact, writers in companies and research groups *should* reference the file cabinet—the way others have “done it before”—prior to undertaking a writing project. These historical documents are usually good models of writing style, typical document length, and layout preferences; as well as examples of the sections and formats expected by a particular publisher or funding agency. Starting your document by following the path paved by others is always a good place to begin. In fact, the *STREAM Tools* method, outlined in Chapter 1 and further developed in Chapter 2 and Chapter 3, relies on a single fundamental principle: *never start from scratch!* Your team should leverage as much existing material and knowledge as possible, including not just the templates for your document, but content, bibliographic sources, and document structure.

***STREAM Tools* Commandment #7:**  
Never start from scratch.

However, digging into the file cabinet should only be the beginning. As outlined above, each situation has a unique audience, context, and set of expectations. To uncritically take a previous document and insert your own text into its existing format limits your thinking instead of expanding it. Historical documents should be used as models only *after* you’ve determined the audience and purpose of your document. Use historical documents to suggest possible ways to present your content both in terms of style and structure, but avoid using any actual content besides “boilerplate” text. Boilerplate text is text that is not specific to any one document, such as a company’s mission and vision. Since it hardly ever changes, boilerplate content can often be inserted wholesale into unique documents and document types, assuming that the document calls for the content. Likewise, items such as biographical descriptions, team qualifications, or standardized processes can be imported as boilerplate, should the document call for them.

However, it is important to remember that historical documents should serve only as *references* as you develop a new document targeted toward a specific audience and context; historical documents should not be merely duplicated with new, revised content. Some types of historical documents that your team might examine include

journal articles, conference proceedings, theses and dissertations, proposals, and reports. Each of these has specific considerations that we discuss further.

**5.3.1.1 Journal Articles.** Journals often require formatting, usage, and citation methods, among other things, which are unique to the journal or to the discipline. For example, *Nature* has a complex website with at least 20 separate pages of guidelines for submitting a manuscript and a four-page summary sheet of those guidelines (see <http://www.nature.com/nature/authors/gta/index.html>). Likewise, articles submitted to any of the IEEE transactions and journals must adhere to six pages of guidelines (see [www.ieee.org/portal/cms\\_docs/pubs/transactions/TRANS-JOUR.DOC](http://www.ieee.org/portal/cms_docs/pubs/transactions/TRANS-JOUR.DOC)). Assuming that your writing team has clearly articulated the audience and purpose of your document, you may have already determined which journal you plan to target prior to authoring the document. In such cases, the team should reference the submission guidelines (sometimes called “instructions for authors”) on the journal’s website as well as studying those guidelines in actual practice by examining several sample articles. Even initial submissions to a journal should implement the required guidelines—everything from heading style to citation style—since adherence to the guidelines speaks to the credibility of the authors. In other words, a team demonstrates that they “belong to the conversation” partly by presenting their arguments in the format that journal reviewers expect. If a team chooses to submit an article without using the appropriate guidelines, reviewers immediately start to question the degree of care that the authors used in conducting their study. Simply stated, never underestimate the power of superficial appearance.

Many journals provide style files for their contributors; however, when journals produce Microsoft Word style files they frequently lack usability because the creators don’t effectively implement styles in the file or many automatic features such as auto-numbering. In most cases with Microsoft Word style files for journals, the philosophy is something like “use your favorite methods, so long as the final document looks just like we prescribe.” Some journals provide style files in TeX and LaTeX and these style files are very useable: all appearance elements are included so the authors just need to paste their text and after a few tweaks, everything will be auto-numbered and paginated optimally. However, as we discussed in Chapter 1, the problem with this approach is the steep learning curve and relatively low acceptance of TeX and LaTeX outside of specialized circles. Because Microsoft Word style files can be as robust and convenient as those for LaTeX/TeX, and are more widely used, the *STREAM Tools* website provides style files for some popular journals and we encourage you to visit [streamtoolsonline.com](http://streamtoolsonline.com) to see whether a file for your favorite journal has been created. If it has not, we encourage you to create one!

**5.3.1.2 Proceedings/Papers.** Proceedings papers and conference papers often have requirements that mirror those of journals, especially if the conference is tied to an organization that also publishes a journal (as is the case with the IEEE organizations, for example). In this case, the guidelines for proceedings papers will be published prior to the due date for manuscripts, and authors need to adhere to these guidelines just as they would heed instructions for a journal article. In the absence of published guidelines

for preparing proceedings or conference papers, authors should reference the main journals in that field or subfield and implement those guidelines. Just as appropriately preparing manuscripts for journals demonstrates membership in the community, meeting the expectations of the community shows readers and reviewers that your team “knows how things are done.”

**5.3.1.3 *Theses and Dissertations.*** Theses and dissertations are unique publications that rely on a mixture of disciplinary norms, professional society guidelines, and university rules. In general, theses and dissertations don’t look exactly like journal articles, books, or proceedings. Therefore, looking at historical documents recently prepared at your university, in your field, and for your supervisor will help you ascertain the appropriate conventions for these documents. You should also consult with the manuscript review office at the university early in your writing process. They often have specific guidelines that you must follow. *STREAM Tools* makes the process of submitting a properly formatted thesis or dissertation much easier because you can follow the guidelines in Chapter 3 for altering the look of headings (for example) to meet the institution’s requirements. Likewise, you can alter things like margins and page number requirements in the *STREAM Tools* template to match the requirements of the institution. The most important thing to remember is that using a template will streamline your process enormously since using auto-text and other features will reduce the time needed to properly format the document and generate a table of contents.

We have seen thesis templates developed by university staff with the user in mind. These actually discuss the Microsoft Word features needed for compiling a long document, but are relatively rare. Most universities provide templates that discuss the appearance of the final document, but pay no attention to the logistics of compiling a complex 200-page manuscript. If the template your university provides is of this type, one way to proceed is to download the generic thesis template from [streamtoolsonline.com](http://streamtoolsonline.com) and to tweak the styles, as discussed in Section 3.3.1.

**5.3.1.4 *Proposals.*** Proposals merit special mention because they all share a specific purpose: persuasion. Every proposal is written to encourage the audience to act, think, feel, or believe differently than they currently do. Consequently, nearly all proposals have similar parts, although specific contexts, such as a grant proposal or a document responding to a government request for proposal (RFP), might have unique requirements. However, since all proposals share a persuasive purpose, the writing team should begin by clearly articulating the final outcome that is desired from the reader. Is it funding? Is it a process change? Is it new equipment? Is it a contract to build a road? Working backward from the desired outcome, quality proposals build a case for action or change by demonstrating why this particular course will address the specific problem. In other words, quality proposals clearly articulate *both* the problem *and* the solution, while carefully showing how the proposed course of action will *solve* the problem. Most proposals include detailed descriptions of the plan of action including timelines, deliverables, and evaluation criteria. They also frequently include statements of the authors’ qualifications and end by specifically requesting the action desired. Table 5.2 presents a generic and idealized structure for proposals that authors can use to help guide their process when no specific proposal structure is available.

TABLE 5.2. Generic Structure for Proposals

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I.	Introduction
A.	Purpose of the document (to propose some action)
1.	Brief statement of problem (~1 sentence).
2.	Brief statement of solution (~1 sentence).
B.	Overview of the document (see parts below)
II.	Problem Statement
A.	What is the origin of the problem?
1.	<i>What is the ideal state?</i> In an ideal world, what would happen, what would we know, what would we do, etc.?
2.	<i>What is the current state?</i> Comparing and contrasting to the ideal state, what characterizes the situation now that calls for action? How is the current state inadequate, compared to the ideal state?
3.	<i>What are the parts of the problem?</i> Most problems contain multiple constituents. What are the smaller pieces that combine to form the larger problem?
B.	Why is the problem important?
C.	Who is impacted by the problem?
III.	Solution
A.	Overview of solution (often a figure called a “theory of action” or a “logic model” showing strategies, objectives, and goals).
B.	Detailed solution statement that aligns with “the parts of the problem” showing how each constituent piece will be addressed.
C.	Implementation plan
1.	Schedule of deliverables and benchmark dates.
2.	Personnel assignments.
D.	Assessment plan that measures alignment of goals/outcomes with “ideal state”
IV.	Conclusions
A.	Summary of problem
B.	Summary of solution
C.	Request for action

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As always, check with guidelines that are specific to the proposal context. The guidelines shown above are meant only to be the most general parts of a proposal and we advise proposal writers to always—*always*—consult with the audience or funding agency about specific requirements that might not be clearly articulated in request for proposal documents. The unwritten requirements might include types of data graphics they prefer, specific content areas, questions that need to be answered, or who should be on the team. Often, no matter how pointed your questions are, you cannot get this information from the funding agency. This intangible unwritten knowledge is part of the elusive “grantsmanship” skills, and it resides with successful applicants and those who regularly serve on proposal review panels. Your task in this case is to find a good mentor who can guide you through the process and explain what is happening behind the scenes. However, even though certain proposal contexts will have various specific and sometimes unwritten requirements, the basic logic of a proposal, problem and solution, and the basic purpose—persuasion—remain.

TABLE 5.3. Sample Report Types

Informal	Formal
<ul style="list-style-type: none"><li>• Trip reports</li><li>• Field and lab reports</li><li>• Progress and status reports</li><li>• Meeting minutes</li></ul>	<ul style="list-style-type: none"><li>• Informational report</li><li>• Analytical report</li><li>• Feasibility studies</li><li>• Recommendation report</li></ul>

**5.3.1.5 Reports.** Reports generally fall into two categories, informal and formal. Describing the distinction between them can be tricky, but a good operating principle is that “informal” reports usually require less outside research, preparation, and content than “formal” reports do. Formal reports are often longer, more structured, require a team of writers, and carry more weight than informal reports. What both report types share, though, is their purpose: exposition. In most cases, reports record actions or events for others who will use the information contained for guiding actions. Reports usually assume a perspective of “showing the facts.”

Technical communication textbooks, for example, John M. Lannon’s *Technical Communication*, generally agree on the classification of reports. Table 5.3 synthesizes some of these sources to show samples of report types.

Most writers in technical settings will be familiar with the primary parts of a formal report:

- *Executive summary:* provides a very succinct description of the motivation, problem statement, approach, and results.
- *Introduction:* outlines the context of the report, including which problems, if any, necessitated the report, the purpose of the report, background and state-of-the-art, the topics covered in the report (scope), and outlines the document’s contents.
- *Methods:* describes in careful detail what procedures were used during the research process, including materials, and is written clearly enough that another person could reproduce the study exactly.
- *Results:* presents the data and observations that the research methods uncovered. These are simply “the facts” without significant interpretation about what the facts mean.
- *Conclusions:* suggests what the results mean with respect to the topic being researched. Conclusions also synthesize and present trends or important patterns.

Often, formal reports will have additional sections required by that particular type of a report. For example, recommendation reports will recommend a course of action. Similarly, some reports might require abstracts or appendices. However, all formal reports will include the sections above.



Informal reports, by comparison, tend to be less structured and shorter but still contain an introduction that orients readers to the topic, results that present data relevant to the topic, and conclusions that suggest what the results mean. Informal reports can also include a brief section outlining future actions, for example, how a project that has fallen behind schedule will be brought back into alignment with the plan. Similarly, meeting notes might include topics for the next meeting or outline future action that participants must complete.

Regardless of the specific type of document—a formal recommendation report, a memo, a proposal, a conference paper, or a journal article—the key point to remember is that each situation has specific requirements for the writing team. Understanding how others have composed similar documents in the past, including the various purposes and unique structures of each document, will ensure that your team members are operating from the same basic understanding about how your document works within a historical “conversation” of documents. If your team understands this context, you will have an easier time creating your document during Stage 3: The Writing Process.

### 5.3.2 Populate the File Repository

Populating the file repository and evaluating historical documents are closely linked. After you have evaluated documents that your team thinks will be important to access as they author and compose the document, you should place those files into a shared document repository so that everyone on the team works from the same set of shared documents. These documents can include any number of items and you will probably need quite a few files in the shared space in order to get started. Not only will you need sample documents in your repository, you’ll also have “informational” content as well as “legacy” content.

*Informational content* might include, for example:

- The request for proposals
- A proposal submission guide
- An appropriate *STREAM Tools* template file
- Samples of successful (or not) proposals submitted to this agency
- A manuscript development timeline
- A sample budget template.

Each of these documents contains information that the team needs in order to successfully complete the process, but these documents do not contain the actual content.

By comparison, *legacy content* might include, for example:

- Prior proposals, technical reports, publications, and presentations on this subject from your group
- The most relevant references, including published papers in this field
- Bibliographic citations and sources from prior work
- Image files relevant to the topic



- Written notes from the kick-off meeting
- Boilerplate such as mission/vision or personnel bios.

Each of these documents contains content that you might actually use to help complete the process. Certainly, you'll have to generate some new content; however, as the *STREAM Tools* method teaches, the more that your team can leverage existing content—cut and paste—the more efficient your team will be.

Many ways exist to establish file repositories including: shared network drives, a full collaboration package such as SharePoint, wikis, Google Docs, or even a good old file cabinet. We recommend wikis and SharePoint, and discuss both options in more detail in Chapter 6, under the subsection titled “Selecting Communication Tools to Support Teamwork.” Your team might reference this section to determine which method would be most appropriate for your needs.

### 5.3.3 Create a Comprehensive Outline of the Document

At this point, your team knows the purpose of their document and has established the audience, studied historical documents, and constructed a file repository to begin sharing content and orient the team. The next task is creating a comprehensive outline. At this stage, your team will determine what the document should say in order to achieve the purpose, weighing these considerations against any requirements imposed by an audience such as a specific topics required by a request for proposals. The best way to begin constructing your document is to create a comprehensive outline.

Most team members likely will not have thought much beyond the first-level headings at this point—saying “we need a section on broader impacts, a project description, and an assessment plan,” for example. One way to spark a discussion about the best possible outline is to have the team review materials in the file repository. What have others done? Remember that it is your team's job to walk the line between suggesting something innovative and demonstrating your membership in the community of prior authors. One way to do this is to imitate the structure of an earlier, successful document while including new content or new sections that this particular situation might require. Again, *STREAM Tools* teaches that it's most efficient to adapt existing work to new purposes. Consequently, if your team utilizes good models, your process not only become more efficient, its chances of successfully achieving its purpose increase. Of course, you should never uncritically duplicate another document. Even as you draw on the wisdom of the community of documents in the repository, take care to weigh the constraints of your particular situation against the constraints of model documents, adjusting your document to the specific audience and purpose at hand.

Most writers will be familiar with organizing content through outlines. Tables of contents are another way of organizing content that looks much like an outline, and using tables of contents, in fact, is the method recommended in *STREAM Tools*. Examine Figure 5.2, which shows an outline of this chapter's main headings as they appear in the table of contents. Notice how outlines and tables of contents accomplish the same purpose. All levels of headings are shown for each of the first two sections of this chapter (but of course your team should create an outline like this for your entire

- 
- I. In This Chapter
  - II. Definition Stage
    - a. Select your team members
    - b. Hold a kick-off meeting
    - c. Select the optimum combination of *STREAM Tools*
    - d. Analyze the audience
    - e. Formulate the purpose
      - i. Persuasion
      - ii. Exposition
      - iii. Instruction
  - III. Preparation Stage
    - a. Evaluate historical documents
      - i. Journal articles
      - ii. Proceedings/papers
      - iii. Theses and dissertations
      - iv. Proposals
      - v. Reports
    - b. Populate the file repository
    - c. Create a comprehensive outline of the document
      - i. Using deductive structures
      - ii. Using Microsoft Word's outline feature
    - d. Populate all sections with "yellow text"
    - e. Distribute content creation tasks among team members
      - i. Choose a drafting strategy
      - ii. Synchronizing writing styles
    - f. Control versions of shared files

**Figure 5.2.** Outline of the first two major sections of this chapter

document as we did). The outline can go on for many, many pages, if your team does it well.

As part of the *STREAM Tools* method, we recommend creating a comprehensive outline prior to drafting text, and allowing that outline to become your table of contents.

Not only will having an outline/table of contents help the team structure content, it will also help the team determine what content still needs to be developed. Having a good outline also assists the team when it comes to dividing writing responsibilities, assuming your team will be working this way. In other words, outlining is not merely organizing content that already exists; it's a process of discovering what content must be included as well as what content can be omitted.

Once drafted, the outline becomes a container of sorts that enables the team to “fill in the appropriate parts.” Sometimes the content will shift as your team writes, but in general, if you spend time planning your document prior to writing, these shifts are minor. As with all *STREAM Tools* approaches, the object is to speed the drafting process. In this spirit, we suggest that having a “container to fill” usually requires less effort than “inventing the container” on the fly as you write.

**5.3.3.1 Using Deductive Structures.** One method of creating your “container” is to implement a deductive structure in your outline. Usually, outlines proceed from large topics to more specific ones, where the elements of the large topic can be disassembled into the smaller topics. If you look back at Figure 5.2, the outline of the beginning of this chapter, you'll see, for example, that “Evaluate Historical Documents” has five major subsections that describe some of the documents teams might examine prior to writing. Regardless of the topics in your document, determining the overall structure of your document is the first step in drafting because it reveals the major groupings that will be addressed.

Fortunately, many technical and scientific documents follow either the standard report format (introduction, methods, results, conclusions) or they follow a format requested by the audience, as in the case of most grant proposals and government RFPs. In this case, your team's task will be to record the major sections as listed in the RFP held in the file repository, then list topics required in each subsection, and then list sub-subsections. Documents structured this way are *deductive*, which means that they tell readers the most important things at first and gradually become more specific. Over the course of a particular document, this flow from general to specific occurs cyclically as each topic gets its own general heading with more specific subheadings and content coming after each subdivision. Visualizing the structure that moves back and forth between general and specific sometimes helps writers as they begin to draft because it demonstrates the relative balance of content treatment. This technique also helps ensure that writers adequately develop a topic by showing the complexity of its subsections, as well as visualizing the relative “weight” of a topic. Figure 5.3 demonstrates this technique with a book chapter on trust in virtual teams by one of this book's authors. Notice how each of the sections moves from a larger topic, for example, “virtual teams” to the differences between virtual and face-to-face teams to the composition of those teams. Each time, the content becomes more specific, but the overall topic is announced in the heading (and in the opening text of each section). Notice also how the “expanded” sections have relative balance, each with an A and a B and two or three subpoints. Together deductive structure and balance provide readers with a structure that is easy to comprehend and retain.

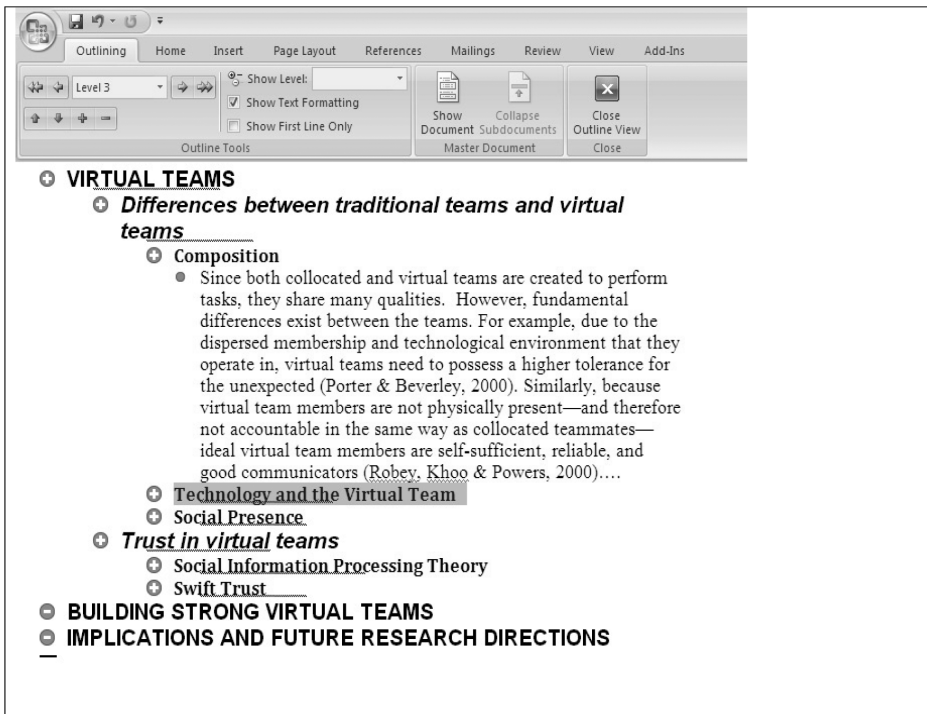
**5.3.3.2 Using Microsoft Word's Outline Feature.** A second way of organizing content within your container is to use the outlining feature of Microsoft Word and then use the outline to create a table of contents. Microsoft Word's outline feature is a robust tool that speeds the outlining process considerably by allowing writers to select topics and move them in the document hierarchy or move them to another part of the document all together. Figure 5.4 shows a screen capture of Microsoft Word's outline feature exactly as it appears on the screen for the document referenced in Figure 5.3.

To see a document such as the *STREAM Tools* basic template in outline view, select "View" from the toolbar on the top of Microsoft Word's interface, then on the left of the view toolbar, select "Outline." This selection changes the view of the current document to an outline view based upon your headings and their heading levels. Since the *STREAM Tools* process requires that you begin with a template document, you should always have a ready-made outline that your team can alter. In other words, your team can change the content of the headings to suit your needs and add subheadings as necessary by clicking *ENTER* after an existing heading and using the *LEVELS* list to indicate which level of heading it should be. Microsoft Word automatically indents or outdents the headings based upon the level you select.

Microsoft Word also uses a series of pluses and minuses to indicate whether or not a topic has subtopics. A plus indicates a complex topic with subtopics and a minus

I.	Introduction and Background
A.	Constituents of a quality team
B.	The role of trust in teams
1.	Components of trust in teams
2.	Types of trust
II.	Virtual Teams
A.	Differences between traditional teams and virtual teams
1.	Composition
2.	Technology and the virtual team
3.	Social presence
B.	Trust in virtual teams
1.	Social information processing
2.	Swift trust
III.	Building Strong Virtual Teams
IV.	Implications and Future Research Directions

**Figure 5.3.** Visualizing "weight" of sections in a document



**Figure 5.4.** Screen shot of Microsoft Word's Outline View

indicates a stand-alone topic. Microsoft Word also uses bullets to indicate content—the body text—that comprises the text related to a particular topic. As you can see in Figure 5.4, there are four main topics to the sample chapter. Topic 1 is fully collapsed, meaning that authors can only see the heading. Topic 2 is partially expanded and shows all of the subheadings within the section and shows the body content within the third level heading of “Composition” (the text has been abbreviated here). The third and fourth major topics have no additional content and so are fully expanded as indicated by the absence of a gray line under the heading and a minus sign before the heading.

As they write, authors can collapse or expand topics by highlighting a line then clicking the plus or minus button in the upper left of the interface. To move topics, subtopics, or body content, authors can simply highlight a topic, then click and drag it to another place in the hierarchy. Alternatively, authors can use the up and down arrows in the upper left of the interface next to the plus and minus buttons. This method of moving topics allows writers to move only one place at a time, while highlighting, clicking and dragging enables writers to position text wherever they prefer in the document.

Microsoft Word's Outline feature is extremely helpful as authors structure their document because it allows expansion, compression, and mobility of topics. It also enables authors to easily insert or delete topics without the cumbersome task of

numbering and lettering outlines manually. Finally, the Outline feature easily becomes a container for content as authors simply insert body text—in the form of bullets—under a heading. If there is no body text for a topic, then the topic either needs to be more fully developed or absorbed into another topic. Likewise, if a particular topic begins to develop too many body paragraphs, which are indicated by the bullets in Outline view, the authors might want to think about adding additional subheadings. One great advantage of the Outline feature is that it allows you to visualize your document, much like a table of contents, to see just how adequately and equally each topic has been developed.

### 5.3.4 Populate All Sections with “Yellow Text”

At this point in the process, your team has both a repository of documents and an outline of the document according to the guidelines indicated by your audience and purpose as well as similar document types. The next task is to determine the generic *type* of content that should populate the outline. This is where *STREAM Tools* introduces the concept of “yellow text.” To create yellow text, type into the body of the document, select the highlight tool on the Home Ribbon, and then run your cursor over the text to make it yellow.

In *STREAM Tools*, “yellow text” is shorthand for the description of content, but not the content itself. In other words, yellow text allows your team to decide *what type* of content is needed in a specific section long before the team has actually written that particular content. In addition to helping guide content creation by explicitly articulating what is needed in each section using yellow text, you make it easier for members of your team to re-appropriate applicable legacy content. It is entirely possible that a member of the team will know where a specific type of content already exists in a form that could be adapted to the new situation. How many times have you been part of a writing team where you thought “You know, I wrote a very similar argument in that proposal/report/journal article that I submitted last year. I bet I could adapt that content to fit here”? In short, the yellow text has two purposes:

1. To record in the outline what type of content needs to be included in the final document.
2. To direct the team to files in the repository that might contain content that can be adapted for a new purpose.

In practice, many yellow text entries will combine both sets of information, the generic type of content necessary and a reference to a possible source to adapt. For example, in the Results section of a paper, the project leader could write “make sure to include the results of measurements and compare them to simulations; refer to last year’s tests for a model.” This steers the writing team in the right direction, but does not include the actual text of the results. Writing content comes later as part of the Writing Stage detailed in Section 5.4.

The point of yellow text is to populate the outline with guides to constructing the text in order to assist in clarifying meaning that headings might leave ambiguous.

Descriptive headings are certainly advantageous, but yellow text clarifies beyond a doubt what needs to be included in a particular section. Think of yellow text as “stage directions” from the director of a play: they contextualize what is happening in the play and what the outcome should be without actually telling the actors how to speak the lines. Yellow text accomplishes the same thing: it tells people what needs to be included without actually specifying the text.

**Note:** Do not confuse “yellow text” with Microsoft Word’s “comment” function. The yellow text is highlighting over the actual text itself and is actually in the document itself, between the lines of the outline. The yellow text is not a comment placed in the margin or indicated by the sometimes yellow mark associated with a comment.

### 5.3.5 Distribute Writing Tasks Among Team Members

Once a comprehensive outline that is populated with yellow text is completed, writing assignments can be distributed. Of course, there are many ways to divide writing tasks, and project leaders need to decide the most effective way to draft their documents *before* they give assignments. In other words, not only should the team be clear about what they’re writing, for whom, and why, they should also share understanding about *how* they will write. In this section we outline a few approaches to constructing writing teams as you consider how to divide work among team members. The most important thing to remember, of course, is that assignments should be given based upon a member’s ability to execute the task with efficiency and precision, whether the individual is writing the content alone or as part of a group.

**5.3.5.1 Choose a Drafting Strategy.** The actual act of writing a document can be daunting. An author might stare at a screen for a while and then grudgingly start typing words on the page. However, if the team has prepared a good outline with yellow text, the process of drafting a document is less like composing from scratch and more like inserting text into existing containers—again, this is the *STREAM Tools* approach of using materials that exist rather than creating everything from scratch. Using existing structures doesn’t mean authors won’t have difficulty writing or that they won’t stall on certain tasks, but using the outline and yellow text as a series of boxes “to fill” definitely makes writing less daunting.

When teams reach a point where they are ready to draft, there are generally three approaches to take: solo drafting, divide and draft, and collective drafting. Each of these approaches has advantages and drawbacks, which are outlined below along with a brief description of each approach.

**SOLO DRAFTING.** Drafting alone has a long history. Many times when we say “author” we imagine the lone writer sitting a desk letting flashes of genius appear in words on a page. That image is deeply rooted—and deeply problematic in many ways

because it contributes to the writing anxiety (sometimes called “writer’s block”) that so many writers feel as they sit down to draft. Drawing on that lone author/genius model, we hesitate to begin writing because we spend time looking for the right words; we think we have to get it right the first time. Additionally, when we author alone, we have more investment in the texts we write, so critiques often hit us harder. Experienced writers practice several techniques to reduce writer’s block including:

- Arranging for time alone. Turn off the phone, quit email, and eliminate the possibility of electronic interruptions.
- Talking over the subject with someone and taping your conversation. Make a rough transcription of the conversation as a starting point.
- Recording your own thoughts aloud as you drive, walk, or exercise and then transcribing your thoughts. Also, consider trying modern speech recognition tools, which have now improved so that they are quite useful. You may choose to carry a digital recorder that can plug into a USB port; there is even speech recognition software that will transcribe text for you. Currently, the leading suite of software tools in this area is called NaturallySpeaking.
- Forcing yourself to write something to fill space on a page even if it’s only a meaningful quotation. Explain the quotation and why it’s relevant to your thinking to get started.
- Writing frequently for shorter time periods. Plan to write 30 minutes every day rather than 5 hours on a single day so the material stays fresh in your mind and so you know that you “have to write” for only 30 minutes.

For those who are a bit more adventurous, some authors have suggested these more exotic techniques:

- Give yourself little rewards. For example, you cannot have that piece of cake in front of you until you finish this page.
- Divide your tasks into five numbered categories. Throw a die. If you get a number from 1 to 5, work on that task for the next hour. If you get a 6—lucky you—take a break.
- Hang upside down for a while. The new blood circulation pattern will help your brain function better.
- Work outside. There are laptops with bright screens suitable for use outdoors, for example, many Fujitsu laptops have this feature.
- Explain the essence of your manuscript to a complete outsider (your friend or relative) and have them write it up for you.

Usually, a combination of techniques works best (whether traditional or exotic) and a complete range of techniques would fill a large book. If you feel anxiety about writing, you are certainly not alone. Many others around you feel the same way, largely because we hold strongly to our notion of the lone author/genius model. For most



TABLE 5.4. Solo Drafting: Strengths and Weaknesses

Solo Drafting Comparison	
<i>Strengths</i>	<i>Weaknesses</i>
<ul style="list-style-type: none"><li>• Enables efficient drafting</li><li>• Produces consistent documents</li><li>• Frees time for other team members</li></ul>	<ul style="list-style-type: none"><li>• Relies on the author to have complete knowledge on the issue</li><li>• Restricts opportunity for multiple perspectives and approaches</li><li>• Increases opportunities for tension</li><li>• Presents additional risk for missed deadlines</li></ul>

workplace writing situations, we simply can’t wait for genius to descend upon us; we have work to get done—fast.

Even with the challenges sole authorship poses for writers, it does possess many advantages that can help ease the writing burden of the team, especially when one person on the team has demonstrated particularly strong writing abilities. In this case, asking for a single person to author the text might be a good idea because the consistency of style, look, and mechanics that a single author brings might save time in the editing portion of the project. Relying on a single author also increases the accountability for the text since one person is ultimately responsible for it. Finally, solo drafting frees other team members to work on other tasks, such as conducting research for the author, or editing text as the author produces it. Adopting the solo drafting strategy does require a huge amount of trust on the team’s part because the team relies on that single person to represent the ideas for the whole group. Additionally, using the solo drafting strategy requires that the non-authoring team members subordinate their role and, in a way, become subject to the needs of the author. In short, the sole author, once the writing begins, has charge of the project.

Although solo drafting can be very efficient, it can also have some downsides. Obviously, the project will suffer if the sole author has a significant knowledge gap. Likewise, the sole author might have a particular viewpoint on the issue that doesn’t adequately represent the interests of the whole team. As a result, tension might develop among team members who feel that their inputs are not valued or heard. Finally, and very pragmatically, relying on a sole author means that if that author misses a deadline, or becomes ill, or is drawn away on another project, the entire team will suffer. In most large writing situations, solo drafting is not the ideal strategy because of these weaknesses. Table 5.4 outlines the strengths of solo drafting.

**DIVIDE AND DRAFT.** The second strategy, divide and draft, is the most common approach and the one in which most writers feel comfortable. In this strategy, different authors are assigned responsibility for different portions of the text, either due to their interests or expertise. Multiple individuals write their pieces of the document separately and periodically check in with one other to make sure that they all still agree on the direction of the document. This strategy works like a computer network, where the parts add together to form a whole greater than any one of the parts and where failure

TABLE 5.5. Divide and Draft: Strengths and Weaknesses

Divide and Draft Comparison	
<i>Strengths</i>	<i>Weaknesses</i>
<ul style="list-style-type: none"><li>• Employs a familiar paradigm</li><li>• Enables efficient drafting</li><li>• Protects the team from wholesale failure through a networked approach</li><li>• Offers thorough treatment of multiple topics by area experts</li><li>• Integrates multiple perspectives on the topic</li><li>• Doesn't overtax any single team member</li></ul>	<ul style="list-style-type: none"><li>• Produces inconsistent texts</li><li>• Adds additional time to the project for extensive editing at the end of the drafting process</li><li>• Assumes writers will maintain awareness of other authors' work</li></ul>

by one piece of the system doesn't signal the collapse of the entire project. This strategy brings together the experience, vision, and perspectives of multiple people, and when the final pieces are compiled, usually results in a document that is stronger than any one person could have produced.

However, using the divide and draft strategy leaves a large portion of work for the very end of the writing process. Whenever multiple authors are involved in a project, inconsistencies will invariably arise even though the team might have carefully prepared a style guide. Realistically, one cannot expect different writers to sound completely alike even when working from the same style guide and after working together for a number of years. Additionally, unless writers share drafts in process, individuals might produce text that contradicts, challenges, or leaves out content vital to another section. For example, in the case of outlining dependencies where one point relies on prior points, one author might incorrectly assume that another author has adequately established the context for later discussion, when in fact they had not. Consequently, the efficiency gains of this approach are somewhat mitigated by the overhead necessary at the end of the drafting cycle to make a multi-author document internally consistent, in terms of both content and style. To overcome this difficulty, one single editor should be appointed, preferably someone who has not written in this particular document and therefore can look at it with fresh eyes. The role of the editor is to meld individual contributions into a single, consistent text. Table 5.5 outlines the strengths and weaknesses of the divide and draft strategy.

**COLLECTIVE DRAFTING.** Collective drafting requires the most time investment from authors, but usually produces the highest quality documents. This strategy requires so much time because authors literally write together, either physically side by side, or by utilizing an Internet-based application such as GoToMeeting or Adobe Connect for sharing files among writers in real time. In web applications such as Adobe Connect or GoToMeeting, one team member initiates the meeting and has the document in question residing on his or her computer. The document-holder member opens the document and then shares his or her screen with other team members, who have accessed the meeting through a web browser. At this point, the team member who initiated the meaning can share keyboard and mouse controls with other team members so

TABLE 5.6. Collective Drafting: Strengths and Weaknesses

Collective Drafting Comparison	
<i>Strengths</i>	<i>Weaknesses</i>
<ul style="list-style-type: none"><li>• Builds strong ties among team members</li><li>• Integrates multiple perspectives into the process</li><li>• Infuses the process with energy</li><li>• Produces consistent final products</li><li>• Produces highly accurate products</li></ul>	<ul style="list-style-type: none"><li>• Requires extraordinary amounts of time to be done well</li><li>• Relies on team members possessing negotiation skills</li><li>• Runs the risk of producing groupthink to the detriment of the product</li><li>• Can induce ill will among team members</li></ul>

that everybody on the team now has the opportunity—one-by-one—to write in the document that resides on the computer of the meeting initiator.

This approach works best in teams of three or less, because having more than three voices becomes chaotic and counterproductive. However, the multiplicity of voices present during the drafting process ensures complete treatment of topics and provides an energetic setting that easily carries the drafting process forward. Multiple writers can talk through their ideas as they write together, and in doing so, no surprises appear in the final versions of the document. This means that: dependencies are addressed more easily and comprehensively, the style is consistent, and content in one place doesn't conflict or challenge content in another place. Finally, having multiple eyes looking at a single document increases the overall quality since different readers will see and hear different mistakes or weaknesses in the document.

**STREAM Tools Commandment #8:**  
Iterate.

However, even though this highly interactive process builds rapport among team members, the amount of time it takes to draft this way can be staggering. Consider that potentially every sentence, every point, every turn of phrase has to be discussed and negotiated. While this generates a great deal of collective ownership in the document, the process takes a long time. A related weakness is the concept of “groupthink” where team members manage to persuade themselves and each other of a particular perspective, even though that approach might not be most productive. In this case, maintaining the close social bonds that form while drafting becomes more important than the quality of the finished project. Another downside of this approach presents itself when team members either do not get along well or begin the process with highly divergent viewpoints. If the team enters the drafting phase while maintaining strong differences of opinion, an extraordinary amount of time will be necessary for negotiating differences prior to and during the drafting process. Even with these significant weaknesses, and

assuming that teams have the time to engage in this process without missing deadlines, this approach can be very powerful. In fact, a large portion of this book was written in this very manner. Table 5.6 outlines the strengths and weaknesses of collective drafting.

**5.3.5.2 Synchronize Writing Styles.** Regardless of the way that writing tasks are distributed within your team, differences will always exist among participants. Consequently, the more that your team can completely articulate the final form of the document *prior* to embarking on the writing process, the easier the writing process will be. For example, something as simple as two team members who differ on the spelling of a color might derail the project and significantly damage the synergy among the team. So, before your team begins to write and after the writing assignments have been given, your team needs to decide, for example, if the color just lighter than black is spelled “grey” or is spelled “gray.” Both are correct. Another example is that some writers will choose to use dashes for emphasis and some will use commas. Both are correct. Both depend on unique style differences of individuals. Because styles can be so different among individuals we recommend that writing teams construct a *style guide* prior to writing and a *style sheet* that evolves with the project. We discuss each of these below.

**DEVELOPING AND MAINTAINING A STYLE GUIDE.** When working with a team, each participant’s unique style can be very problematic because as different authors weld their pieces together, the resulting document will look exactly like what it is: a patchwork compilation of different styles. Consequently, whenever writing as part of a team or as part of an organization, teams should use a “style guide” to direct their work. Style guides assist with consistency across the document and across authors in multiple areas. Consistency across the team and across the document is not only important for authors, but for the reader as well; stylistic inconsistencies, such as interchanging references or visual cues, can be confusing. This is why the purpose of *STREAM Tools* itself is to ensure that multiple writers produce a consistently formatted document by utilizing the built in style features of Microsoft Word.

Disciplines often have a style guide that they follow like the *Chicago Manual of Style*. Likewise, companies and publications often utilize style manuals specific to that organization, and teams working within the organization must adhere to those guidelines. Frequently, though, these guides are either too complex for easy use, or conversely don’t provide coverage of issues relevant to your team (like using alternative spellings for grey/gray). Another complication is that writing teams often don’t have one set style that they *must* use, so their style evolves during the composing process which results in a great deal of reverse editing for consistency. If a writing team makes as many decisions as possible *before* writing, authors will know from the beginning how to spell “grey/gray,” how to label figures, and whether the document has an informal or formal tone, for example. While *STREAM Tools* reduces the load of much of this work, teams still should develop or adopt style guides prior to composing.

One might think that if a single person has been assigned to compile the final document, then style guides and templates are not important. However, the issue is efficiency. If the materials from numerous contributors arrive in as many formats as

there are contributors, then the compiler is stuck with endless hours of mouse clicking to get the document to look right—a step that could have been avoided. In some cases, there is a special administrative assistant hired to compile documents. However, in most cases, the mouse clicking that could have been avoided falls to the group leader and final approver of the document, whose time is usually the most costly. When a group leader is forced to complete these types of small changes, it ultimately costs the organization great amounts of money—not only because the leader is forced to complete unnecessary low-skill tasks, but because he or she is prevented from spending that time performing other strategic activities like locating funding opportunities or resolving personnel issues. Synchronizing writing styles and introducing some of the select features of *STREAM Tools* will help alleviate most of these issues.

The “*STREAM Tools* Style Guide Tool” (adapted from Carolyn Rude’s book, *Technical Editing*) represents the minimum topics and decisions that need to be made to ensure consistency.

#### The *STREAM Tools* Style Guide Tool

##### Verbal Style

1. Meaning of words and only one term per concept
2. Level of diction, complex or simple sentence patterns, formal or informal style

##### Visual Style (*STREAM Tools* accounts for much of this)

1. Typefaces for each type of text, such as headings or body text
2. Layout choices, such as the position of headings and figures
3. Elements, such as icons and colors
4. Table and figure labels, typeface, use of callouts and captions

##### Mechanical Style

1. Spelling
2. Capitalization
3. Numbers
4. Punctuation
5. Documentation style (for references and bibliography)
6. Abbreviations
7. Emphasis devices such as bold, italics, or underlines

Mechanical Style	
I.	Spelling: all words will use the less formal, American usage.
a.	Example: gray
b.	Example: theater
II.	Capitalization
a.	The initial letter in all lists will be capitalized
b.	<i>STREAM Tools</i> will be capitalized and italicized at each use

**Figure 5.5.** Sample entries in a style guide

A-D	E-H	I-L
CD (for 'compact disc')	Email (not e-mail)	Internet (initial capital)
M-P	Q-T	U-Z
Military Police (initial capital)	Typeface	Under-the-Influence

**Figure 5.6.** Sample entries in a style sheet

When drafting the style guide, teams should first list the topic and then list an example of that particular topic (Figure 5.5).

Because style guides are comprehensive, they can grow to be lengthy depending upon the complexity of the project. However, articulating each of these decisions prior to writing speeds the editing process, making it easier for multiple authors to integrate their work into a single unit. Again, the main idea of *STREAM Tools* is to fill containers, not to make decisions on the fly, simply because those decisions lead to inconsistencies that impact the document’s credibility with readers and create more work for editors.

**DEVELOPING AND MAINTAINING STYLE SHEETS.** While *style guides* are comprehensive and prepared prior to authoring, *style sheets* evolve with the project as authors make specific decisions about items not covered within the parameters defined by the style guide. A common method for developing a style sheet is to prepare a grid that records decisions alphabetically in a grid as shown in Figure 5.6 (adapted from Carolyn Rude’s *Technical Editing*.)

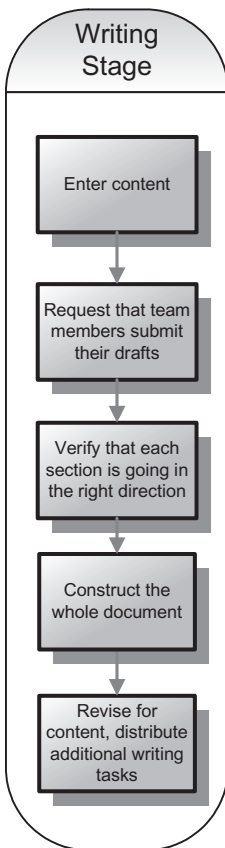
The <i>STREAM Tools</i> Style Sheet Tool		
<i>A-D</i>	<i>E-H</i>	<i>I-L</i>
<i>M-P</i>	<i>Q-T</i>	<i>U-Z</i>

The challenge of using a style sheet is that authors frequently make decisions unconsciously based upon their experiences and therefore may not record their choices on the sheet. A second challenge is that authors might forget to refer to the style sheet as they write, introducing preventable inconsistencies into the writing. However, if writing teams participate in constructing as much of the style sheet as possible prior to beginning the writing process, they will be more aware of the choices outlined. In addition, as teams become more skilled at collaborative authorship, they will begin to see the utility and efficiency of referring to style sheets as they enter the completion stage of the process outlined in Section 5.5. In short, referring to the style sheet and recording choices on the style sheet while writing significantly reduces the amount of time that team members will spend editing documents.

Once your team has successfully defined the project and adequately completed the groundwork necessary for an efficient writing process by evaluating historical

documents, populating a file repository, creating a comprehensive outline, populating the outline with “yellow text,” and distributing writing tasks, then writing can actually begin. In all, the first two stages of the *STREAM Tools* Writing Process should compose about 50% of the project time—excellent preparation leads to efficient writing and completion.

## 5.4 WRITING STAGE



The actual process of writing a document should only occur after a thorough definition and preparation process as outlined in the sections above. Sometimes, of course, your team will need to produce a document quickly without having the necessary planning time, but in most cases, if your team did plan, not only will the actual writing be easier, the end result will be of far higher quality. And just as definition and preparation are both a process, so is the writing stage. In the *STREAM Tools* process, teams move from creating content to collecting drafts to verifying that each team is on target, compiling the document, and finally to revising for content (and moving through the process again, as necessary). We discuss each of these steps below.

### 5.4.1 Enter Content

Content comes from many sources: from published literature, from new information or original research generated by your team, from presentations, conversations, or other types of content that you might have in your file repository. Regardless of the source, almost every document will combine existing, “legacy” content as well as new content. Legacy content, of course, comes from the files in your repository, while new content is generated by your team to fill holes in the documents that legacy content cannot.

**5.4.1.1 Legacy Content.** Appropriate reuse of material that you already possess can save huge amounts of time while improving the impact of the document. Usually, only senior team members will have the best picture of what legacy content can be included because they’ll have greater experience and a broader range of exposure to various documents. For example, a senior professor is aware of an excellent “Background and Motivation” section in the Ph.D. thesis of a recent graduate from a sister lab, and can direct a new graduate student to that section rather than asking him or her to spend time “reinventing the wheel.” When entering legacy content, your team will need to modify the content to suit the novel purpose because it’s unlikely that the old material will fit exactly into the new context. Refer back to your audience



and purpose to determine which “yellow text” sections the legacy content might fill. Copy the text (or figure or table) into the new document and when the time comes, your team will integrate that content with the new content so that your document sounds fresh.

This leads to an important point: reuse of legacy content needs to be managed carefully to avoid becoming “too efficient” by straying into the area of plagiarism. Plagiarism represents one of the “cardinal sins” of technical and scientific writing for good reason, since the point of this type of writing is often to explore new topics and present new content. If your document looks too much like an earlier piece, then not only does it present information that has already been published, it demonstrates that perhaps your team wasn’t willing to do the work necessary to adequately solve the problem your team is writing about. In either case, simply copying and pasting can be very dangerous and needs to be managed carefully.

Some exceptions exist, of course, depending upon the type of document. For example, in a report that goes out to customers, a company’s mission and vision might be copied and pasted exactly as they appear in the file repository. Likewise, “standard” content describing a common procedure or method could be imported from the repository; however, in general we recommend that any text that has been *directly imported* from the file repository should be marked in the document by highlighting it as “red text” to show that this information is “hot” and needs to be integrated and/or cited. When your team generates new content to surround the red text and modifies the red text to integrate seamlessly with the new content, you can remove the red highlighting—making sure to retain any appropriate citations, of course.

**5.4.1.2 New Content.** Every writing situation is unique, even though many situations share similarities. One proposal for the National Science Foundation probably looks just like another in terms of headings and section divisions, yet the content will be largely novel in a new proposal. The same goes for journal articles: each journal has a particular way of structuring articles, but your article will not contain the same content as another even though they might sound alike and look alike. Much of your file repository comprises these sample documents, which your team will use to construct a comprehensive outline of the document. Your team will also enter appropriate legacy content so that you’re not creating everything from scratch as you write. Instead, as *STREAM Tools* teaches, your team “fills containers.”

But even filling containers takes a lot of work and original thought and your team will need to develop new content to go with the legacy content. To adopt a metaphor, think about the process of painting a wall. The best paint jobs start with a thorough coat of primer, followed by an initial coat of paint. Then the painter sands to remove rough edges, cleans the paint of debris, and applies another coat. The painter might repeat the process of sanding and painting several times, depending on what is being painted, before the job is finished. Writing is similar in that research shows that the best writers never think their first pass is the final one. And, in reality, it almost never is. Most formal documents must go through three, four, or five iterations before they are ready to be viewed publicly. Consequently, writers need to drop the pretense that they’ll get it right on the first try. They won’t; you won’t. And even if your team does

think that they nailed the first draft—or piece of a draft—on the first try, odds are that an editor or more senior team member will review the document and find all sorts of problems.

Using the *STREAM Tools* method of re-using as much legacy content as possible eases the process of generating new content, but seasoned writers know several things: that at some point they will be forced to simply sit down and write, that they can't afford to be married to their content, and that they'll almost certainly have to revise what they write. Writing becomes far less daunting when we realize that we don't have to get it right on the first try. Nobody expects us to.

**5.4.1.3 Control Versions of Shared Files.** A final concern as your team writes documents is that shared files require a method of confirming who is working on which pieces of a document. This critical concern relates both within specific teams and across teams so that separate groups working on the same document know who has control of which portion.

While using appropriate naming conventions reduces the opportunity for error in your team, a risk still remains. Therefore, when sharing files among multiple team members (or across teams), each individual should “check out” and “return” documents—much like you would a library book—to indicate that for the present time, that document (where “document” is to be understood as any portion of a writing project) is being used by another person. This “check out” system provides a back-up in the instance that somebody has forgotten to change the name of the document indicating the status.

In *STREAM Tools*, we suggest that you use server technology, such as SharePoint or a wiki to make versions available to multiple users. We discuss these technologies in more detail in Chapter 6, but a brief word here is in order. One powerful product, SharePoint, keeps track of versions and check-in/check-out status, among other things. However, SharePoint has a learning curve and requires the support of IT staff, so it might not be the right choice for your team. Perhaps your team might choose to use a wiki to accomplish the same ends. With wikis, users must record the status of the document, at minimum “checked out” or “available.” This status flag alerts other team members that they should not be working on the document at the same time and that they should check back later to continue their work on the document or to review the work that another individual has completed. This process creates a history of the document's developments while simultaneously incorporating quality control, since multiple authors review new work as it develops. Using a wiki, one author writes a new piece of text, another author reviews the contribution, potentially adding revisions to the first round of text and then submits it to other team members who might go through the same process—one at a time. This process creates deeply interwoven documents that possess:

- Consistent writing style
- Thorough coverage of content areas
- Precise development of logic
- Accurate mechanics

If a team implements a process like this and shares files successfully, the team will spend its time writing rather than struggling to figure out which document contains what content or where a certain heading was in one document versus another document. We recommend utilizing this file management system to avoid “leapfrogging.” As with all *STREAM Tools* processes, the purpose is to let your writing team be as efficient and effective as possible by using standardized approaches. It also encourages the team to see writing as a collaborative process since no team member will “own” a particular piece of a document. All team members will share, to the extent they want or are able, in creating a document and all team members are equally able to critique and modify another’s work. This helps teams past the mental roadblock of believing that they have to get it right the first time because the process simply won’t allow that to happen!

### 5.4.2 Request that Team Members Submit Their Drafts

One important result of viewing writing as a process is that we can ask team members to submit drafts early and often to the team leader. This step might seem unnecessary if we view writing as a process—why would teams submit intermediate drafts?—but the step is key because it builds accountability into the process. Unfortunately, many of us will put off our duties until just before they are due. Writing simply doesn’t work that way. If a team puts off beginning their work until just before the deadline, not only does it cause great stress, it also produces a poor document that has not benefited from the process of going through multiple iterations. Therefore, it is important that teams and their subgroups complete their assigned sections as soon as possible.

On the other end of the spectrum from procrastination, a team without intermediate deadlines may continue to iterate endlessly. In this case, a team has taken to heart the idea that writing is truly never finished and as a result continues working on a piece of text until it actually begins to get worse. Think again about the painting metaphor. There’s a breakpoint where too many coats of paint begin to obscure architectural details. Too many coats of paint also create the possibility that errors will be introduced: maybe somebody uses the wrong shade of paint on one wall, or creates a drip that dries into a bump, necessitating yet *another* iteration of the sand-and-coat process.

In every writing process, a point of diminishing returns exists for continuing iterations; accordingly, writers need to recognize when they’ve reached that point and are actually beginning to make their documents worse. Likewise, going through too few iterations will produce a poorly developed or ill-conceived document since enough time has not been spent improving the document. If a team is forced to submit their drafts at staged intervals, both downfalls can be avoided.

### 5.4.3 Verify that Each Section Is Headed in the Right Direction

A close cousin to intermediate draft submissions is verifying that each submission is headed in the right direction, usually the job of the project leader. The phrase “headed in the right direction” is somewhat ambiguous for the good reason that an experienced project leader has to keep in mind multiple considerations when evaluating intermediate drafts. For example, do all the documents demonstrate the right attention to audience

and purpose? How are the writing teams themselves getting along? Are the teams strong enough to continue? What about modifications to the outline which become necessary as the content emerges? Often necessary content doesn't fit within the existing outline, requiring the team to retrofit the outline to the content. Do the separate pieces overlap, and if so do they complement or contradict each other?

These represent only a few possible considerations that confirm that the project is moving in the right direction. However, in all cases, the confirmation progress requires that teams and individuals submit their drafts at planned intervals to somebody charged with a global view of the project. Perhaps that person is a designated leader, or perhaps it is the person chosen as an editor. Regardless, a single point for collecting and commenting on individual contributions will make the process most efficient.

Finally, as a result of this review, teams might be given extra research jobs or additional writing tasks, or might be asked to abandon some content and move in a different direction. As teams are tasked with new objectives, they should cycle back through the stages of locating and entering legacy content and generating new content. Even with this extra work, teams will produce documents more efficiently when asked to re-route their activities in the middle of the writing process simply because changes that “head off” problems will be minor compared to changes or requests made at the end of the process. Again, it is important to remember that writing is never perfect and is always in process. If we become too wedded to our own text, we forget that what we're really doing is achieving some purpose *through* the document. Keeping the purpose—what the document is trying to achieve—in mind can help writers accept feedback and revision suggestions more easily.

## 5.4.4 Construct the Whole Document

At this point, your team has successfully integrated legacy content with new content and cycled through several iterations with a central reviewer by submitting their documents at scheduled intervals. The time has come to compile the document into one cohesive whole. This particular aspect of the *STREAM Tools* Writing Process is best left to a single individual, perhaps the team leader or the reviewer who has collected the portions of the document throughout the process. This person's job is quite complicated because they must look back to the document's purpose, the document's audience, and to any additional considerations that might exist such as particular content that must be included.

The task of compiling the document is also more complicated than simply pasting together pieces from separate individuals, because the document has to look and sound like it was created by a unified team. If your document looks like or reads like it was stitched together from 10 different sources, it will fail, plain and simple. Very, very few situations will allow for this type of patchwork approach to writing because it appears shoddy and incomplete and speaks to a lack of concern for how the document will be perceived.

So, how does the person compiling the document transform the various contributions they've received into a seamless document? Consider these steps as your team compiles its manuscript:

1. Review the audience and purpose guidelines.
2. Review any formal requirements for content or formatting required in the writing situation.
3. Review the comprehensive outline (even if it was modified) and confirm that you have all the required pieces.
4. Open (or create) a template for your document and change the headings in the template to match the comprehensive outline.
5. Paste the submitted content into the outline at the appropriate positions.
6. Save the entire document.
7. Edit ruthlessly as outlined in below in Section 5.4.5.

This process has proven effective to the *STREAM Tools* authors for over hundreds of documents of all types, and so we encourage you to adopt it. The key point of this process is that the team cannot stop at the compiling stage. A document that has been constructed from multiple voices is never, ever complete and ready for the audience. It will require a great deal more work before the document is even ready to be shared outside of your team.

## 5.4.5 Revise for Content and Distribute Additional Writing Tasks

After the document has been constructed from the separate parts, it needs to be revised extensively to ensure that it appears seamless to an audience. While your team might be tempted to focus at this stage on small matters of grammar, mechanics, and formatting, these represent only a small part of the whole picture. In fact, many surface issues will be handled in the “Completion Stage” of the *STREAM Tools* writing process and so the focus here should be on what technical writing handbooks (some listed at the end of this chapter) call “*comprehensive editing*” as opposed to “copyediting” and “proofreading.” Your team will move through these latter two phases, but only after the comprehensive editing process has woven the document into a seamless whole.

In what follows, we outline the basic knowledge necessary for editing at all levels (including copyediting and proofreading), but we focus on comprehensive editing. For example, we discuss marking up hardcopy and the symbols you should use. We reintroduce the very important *STREAM Tools* Editorial Mark-up Table—a short-hand method of commenting on texts that speeds the editorial process but also systematizes the feedback editors give to writers. We also include a discussion of the robust editing and reviewing tools available in Microsoft Word.

**5.4.5.1 Comprehensive Editing.** Assuming that your team has employed a quality preparation process, the audience, purpose, content, and style should all be known to team members since they were articulated prior to drafting the document. Now the editor is left with a compiled document that needs to be audited against the standards outlined in the Definition Stage and in the Preparation Stage. Comprehensive editing achieves these goals. When working through documents that have recently been compiled and are in the process of being woven together, editors (or team leaders)

TABLE 5.7. *STREAM Tools* Editorial Questions Tool

<i>STREAM Tools</i> Editorial Questions Tool	
<i>Analyze the Audience, Purpose, and Use</i> <ul style="list-style-type: none"><li>• Who will read the document and why?</li><li>• What do readers already know?</li><li>• What should users know or do after reading this document?</li><li>• What are the readers’ attitudes toward the topic?</li><li>• What should happen as a result of this document’s use?</li><li>• What will readers do with the document after reading it?</li><li>• Will users read the document straight through, skim, or choose only parts to read?</li></ul>	<i>Evaluate the Document</i> <ul style="list-style-type: none"><li>• Is the <i>content</i> complete and appropriate for the audience?</li><li>• Does the document employ an <i>organization</i> that the audience will easily recognize and will make sense?</li><li>• Has the document used <i>visual design</i> to support the purpose, ease access to content, and reveal organization?</li><li>• Does the <i>style</i> meet accepted standards for this type of document and is it appropriate for this audience?</li><li>• Are <i>illustrations</i>, figures and tables used to clarify content?</li></ul>

usually make long marginal comments or append queries to the document. These notes and queries might ask authors to clarify their content, or to review particular requirements of the document. The editor might suggest potential revisions that improve the document or bring a particular section into alignment with other sections. The possibilities are quite numerous as the editor performs the job of combining several voices to make one seamless document that meets the needs of the audience and the purpose. Since an editor might have many concerns, we’ve constructed the *STREAM Tools* Editorial Questions Tool shown in Table 5.7. The tool presents a series of useful questions to help editors focus their commentary among all the possible things that could attract their attention.

Of course, this table does not exhaust the possible options for concerns that editors might have. The point is that editors begin the process by asking questions of the document to ensure that it meets the needs of the audience, appropriately addresses the purpose and use, and has been presented in a way that demonstrates the authors have carefully considered why, how, and by whom the document will be read. Think of this step as a confirmation that the document has met the specifications articulated in the Definition and Preparation Stages and use this time to suggest high-level revisions that bring the document more in line with those specifications while ensuring seamless presentation.

**5.4.5.2 *STREAM Tools* Editorial Mark-up Table (STEM Table).** A second tool for helping editors as they improve the quality of documents is the *STREAM Tools* Editorial Mark-up Table. The *STREAM Tools* Editorial Mark-up Table (STEM Table) represents one of the most important time savers for managers and leaders who have to review documents. Much like the standard editing and proofreading marks used by editors listed in Section 5.5, the STEM Table (Table 5.8) enables reviewers and authors to note a problem quickly without any elaborate explanation. While the notation symbols in the STEM Table will initially take some time for reviewers and authors to

TABLE 5.8. The Extended *STREAM Tools* Editorial Mark-up Table (STEM Table)

Comment	Abbreviation Deciphered	Meaning	Section in This Book
c:\AA	Analyze the audience	The document does not address the right audience.	5.2.3
c:\AP	Analyze the purpose	The document has not addressed the purpose or has no clear sense of purpose.	5.2.4
c:\awk	Awkward	Sentence is awkward. Possibly word sequence, word selection, or sentence structure need to be changed.	7.2; 7.3; 7.4
c:\bold	Bold font	Toggle bold font.	
c:\casual	Casual wording	The wording is too casual. People may speak like that, but this wording is not suitable for formal writing.	7.2.1.2
c:\colloq	Colloquial	A colloquial expression. People may say it, but it is not appropriate in this context.	7.2.1.2
c:\EOI	End of iteration	The manuscript contains too many errors. The editor stopped at the EOI point and expects the writer to learn from previous mistakes, apply them to the entire body of the manuscript, and bring it back for the next iteration.	5.3.5.1; Chapter 7
c:\glob	Global change	A request to correct this type of a problem throughout the document. This comment is to be used in combination with other comments, when the same type of mistake occurs multiple times and the editor does not want to correct it every time.	Self-explanatory
c:\gram	Grammatical error	A catch-all comment for grammatical errors.	Chapter 7
c:\muw	Misused words	You are using words incorrectly.	7.2.2.1
c:\model	Model document	Please refer to a good model document after which the current manuscript is structured.	5.3.1
c:\purpose	Purpose	The purpose of this part of the document is not clear. Should it be persuasion, exposition, or instruction?	5.2.4

TABLE 5.8. *Continued*

Comment	Abbreviation Deciphered	Meaning	Section in This Book
c:\struc	Structure	The document lacks proper structure.	5.3.3
c:\STH x.x	Writing for Research Teams	Read Section x.x (for example, Section 5.2) from this book, <i>Technical Writing For Teams: The STREAM Tools Handbook</i> .	Self-explanatory
Written in pencil	Regular comment	The comment or correction does not need a discussion.	Self-explanatory
Written in red pen	Talk to the reviewer about it	Usually, a complex subject nature that requires a discussion.	Self-explanatory
c:	Comment	This is not a replacement text but rather a comment.	Self-explanatory
c:\it	Italics	Toggle italics font.	Self-explanatory
c:\pw	Poor wording	The sentence is poorly worded.	7.2
c:\pbw	Problems with black and white	There is a possibility that the document would be printed in black and white, making references to color. For example, saying “red line shows” is meaningless and annoying to the reader if the figure is in black and white.	3.2.3.4
c:\pwt	Problems with terminology	Poor selection of terminology, could be confusing, misleading, or just incorrect.	Self-explanatory
c:\rep	Repetition	Repetitive use of the same word or root.	Self-explanatory
c:\rm	Roman	Use Times New Roman font.	Self-explanatory
c:\tog	Together	Let’s rewrite this part together.	Self-explanatory
c:\S&W	Strunk and White	An error discussed in Strunk and White, one of the most famous books on grammar. Read the book.	Self-explanatory
c:\sp	Spelling	Incorrect spelling.	Self-explanatory
c:\sp?	Spelling?	Possibly incorrect spelling.	Self-explanatory
c:\WV	Watch the video	Typesetting mistakes, which are described in the video tutorials.	

learn, the payoff is quite substantial because reviewers—those managers and group leaders whose time is most expensive—can make very substantive commentary without typing (or handwriting) long notes.

The system is fairly simple: the initial characters (c:\) indicate that a comment follows (as opposed to actual text that needs to be entered into the document). The



characters following the slash ( \ ) indicate that nature of the problem. The table also provides references to sections in this book where one will find full discussions of various topics, so that the writing team can refer to specific sections if they are unclear about how to revise. Our experience using the STEM Table indicates that once a group has learned the system, the review process becomes much quicker as does the revision process since all members of the team refer to the same set of common symbols.

While we have included here a set of possible marks, individual teams might have already evolved their own symbols or might wish to create their own. If your team would like to add to the STEM Table, visit the *STREAM Tools* website at [streamtoolsonline.com](http://streamtoolsonline.com) and add your marks. Alternatively, you can also download a version of the STEM Table with blank rows from the website if you choose to create your own version and circulate it among your team members.

**5.4.5.3 Strategies for Editing Electronic Copy Using Microsoft Word—An Overview of Microsoft Word’s Commenting, Reviewing, and Proofing Features.** Finally, those who review documents might choose to make their marks electronically rather than on paper. Microsoft Word contains a robust set of tools for commenting on documents, as well as for reviewing and proofreading. For example, most Microsoft Word users are familiar with the squiggles that appear under misspelled words or poorly phrased sentences. Probably fewer people are aware that authors can alter why those squiggles appear, can turn them off entirely, or better yet, use them effectively. But the squiggles are only a part of the suite of tools available for reviewing (and writing!) documents. Microsoft Word enables commenting, change tracking, and side-by-side comparison of documents. As part of *STREAM Tools*, authors should use these functions to enable efficient collaboration among the team members. Below, we provide an overview of these functions, including when to use them and basic instructions on how to use them.

**COMMENTING ON DOCUMENTS.** In traditional editorial practice, editors provide queries to authors in the margins or on paper sticky notes. But Microsoft Word enables reviewers to comment electronically on the document itself by inserting “balloons” that appear at the point of the comment. These balloons appear on the right side of the document in an expanded “margin” and can be printed if the document authors choose to review the comments in print rather than on the monitor. The primary purposes of the comment function include asking authors questions, clarifying particular points, correcting incorrect information, or suggesting revisions that would strengthen the document.

Figure 5.7 shows a commented page from an early draft of this chapter. Notice that two separate people commented on this chapter, as indicated by the initials. The color assigned to each reviewer will also change, although that color isn’t reproduced here.

Commenting on documents requires only a few steps to begin:

1. Save the file as a different name to protect the integrity of the original version (just in case something goes wrong).
2. Click to the **Review** tab on the top of Microsoft Word’s interface.

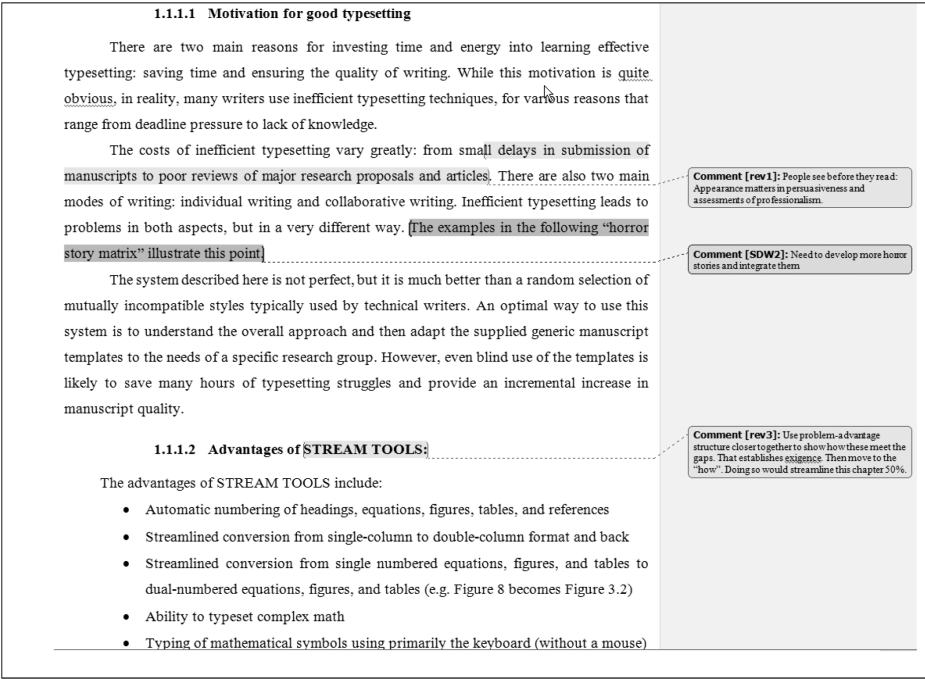


Figure 5.7. Commented page from an early draft of this book

3. Verify reviewer/user information (see below).
4. Turn on change tracking by clicking **Track Changes**.
5. Highlight or insert the cursor or where you'd like to comment.
6. Click **New Comment** and type your note in the box that appears on the right margin.

While most of these steps are straightforward, and most users are probably familiar with commenting, step 3, "Verify reviewer/user information" requires a bit more commentary. When a team has authored a document, it's vital that each individual be accountable for their own work and Microsoft Word allows readers of a document to see who has commented or made changes in a document. Unfortunately, most authors and editors overlook this vital step. In many cases, following the steps below would eliminate confusion over who has made what commentary by establishing a reviewer's "identity":

1. Click the **Review** tab on the top of the Microsoft Word interface.
2. Click the small arrow on the **Track Changes** button.
3. Select *Change User Name*.

4. Select *Popular* on the left side navigation.
5. Type your name and initials under *Personalize your copy of Microsoft Office*.

After you complete this step, every time you leave a comment in a document or make an edit, your identity will appear along with that comment in case an author needs to speak with you about your note.

**REVIEWING DOCUMENTS.** After the team members responsible for editing the document have commented on the authors' work, authors have the opportunity to review the comments made by the editors and make appropriate changes. To view the commentary, simply open the document and either 1) scroll through it reading the comments as they appear, or 2) click the **Review** tab, and click the **Next** button on the **Comments** ribbon to move to the next comment. Alternatively, for a more global view, authors can select **Reviewing Pane** and all the changes and comments in the document will appear in a separate window on the left side of the screen. Assuming that the editors selected **Track Changes** before they began working on the document, every change they introduced will appear in the reviewing pane, and authors can then sort through all of the comments and changes proposed. This review stage can be repeated as many times as necessary throughout this step.

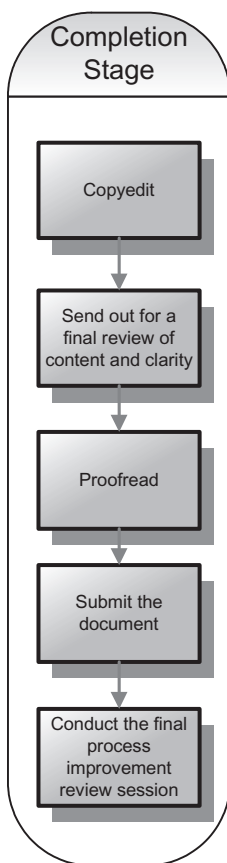
### 5.4.6 Distribute Additional Writing Tasks

Once your team has completed the review process, whether on paper or electronically using Microsoft Word, the teams will need to return to the document and make the appropriate revisions. Sometimes this involves substantial rewriting that might include additional research. Sometimes, it's a matter of deleting some words or reorganizing a few paragraphs. Whichever the case—small revisions or large—the project leader will need to assign a priority to the tasks that the teams must complete. Each team can then complete the tasks as required, carefully reviewing the commentary from the reviewer as well as additional instructions from the team leader (who might also be the reviewer).

After the document has been compiled and reviewed in the manner we've described, version control becomes even more imperative. Refer back to Section 5.4.1.3, "Control Versions of Shared Files" as a reminder about controlling file versions. At this stage when your team has a complete document and now is in the process of improving it, "leapfrogging" becomes a real concern because changes that have been implemented might not be included in the file if teams leapfrog over each other. To avoid this common problem, pay very close attention to the "check-in/check-out" procedure so that each team's revisions are included.

Finally, expect that your team will complete the "Writing Stage" more than once; the process is iterative and so it should be viewed as a series of cycles. Each cycle improves the document as a whole under the careful guidance of the editor or project leader. Again, each team and team member must subordinate their ego to the goals of the document. Nobody "owns" the text that they have written; genuinely internalizing the idea that writing is a process will help with this.

## 5.5 COMPLETION STAGE



The completion stage represents the final portion of the *STREAM Tools* writing process. At this point in the process, your team has clearly defined the project, prepared to write, completed some writing, and undergone several revision cycles. Your document is almost ready for reviewers outside of your team. We say “almost” because the document still needs to be “copyedited” before it goes to external reviewers for their feedback on content and clarity. After the document has been copyedited and reviewed, the team makes minor mechanical and formatting changes, proofreads the document, and submits it. As the final step in completion, the team conducts a “postmortem” on the project to review the process and discuss ways that it might be improved in the future. We take up each of these steps in the following sections.

### 5.5.1 Copyedit the Document

In comparison to the formative feedback offered in comprehensive editing as outlined in Section 5.4.5, the purpose of copyediting, as noted in Rude’s *Technical Editing*, is to confirm that a document is correct, consistent, accurate, and complete, not to suggest major changes to content, organization, or style. Copyediting, then, is what most people think of as “editing” and probably “proofreading” because it ensures the document’s adherence to accepted principles of “good writing” on the surface level rather than addressing deeper issues. However, copyediting is just the second phase in an

editing process that stands *between* the type of comprehensive editing we previously discussed and proofreading which we address in Section 5.5.3.

Copyediting, like comprehensive editing, addresses multiple aspects of a document, and accordingly, your team should view copyediting as a series of steps rather than a single review of the document. Your team should review for *correctness*, *consistency*, *accuracy*, and finally *completeness*, addressing the concerns outlined below one a time:

1. **Correctness:** Does the document use standard English in spelling, punctuation, and grammar? Does it follow rules published in dictionaries and grammar guides?
2. **Consistency:** Does the document present terms, numbers, and words consistently throughout? Are there arbitrary variations in usage, terms, or numbers?
3. **Accuracy:** Is the content accurate? Do the tables have accurate numbers? Do equations calculate? Are titles properly used? Does the document tell the truth?

4. *Completeness*: Does the manuscript contain all of the parts required for a document of this type? Have all the questions been answered or the topics been addressed?

The kind of mistakes that your team will be looking for during copyediting—particularly mistakes of correctness—tend to derail readers the most. Errors such as misspelled words or improper subject-verb agreement severely deflate a reader’s confidence in your document and damage the document’s credibility. Consequently, teams should pay close attention to copyediting and not view it as a perfunctory step.

However, we recognize that in addition to producing the highest quality documents possible, writing teams need to copyedit documents *efficiently*. We have identified the most common errors made in technical documents and developed a system, to speed up the copyediting process. The *STREAM Tools* Editorial Mark-up Table, introduced in Section 5.4.5.2, shows annotation marks, explanations, and examples of the most common errors that technical writing teams make. Even though we recommend using the *STREAM Tools* Editorial Mark-up Table as a basis for both comprehensive review and copyediting, writers should also be familiar with the standard copyediting and proofreading symbols shown in Table 5.9, since editors may also include some of these marks in your documents.

In short, the copyediting process looks for the kinds of superficial errors that tend to detract from a document’s credibility. Readers are very likely to dismiss a document with many surface errors or even one error in accuracy, so we encourage your team to copyedit with care. Make no mistake: editing carefully takes time. Your overall project plan should build in sufficient days to complete the process—a process that involves both the marking of the document (either on paper or electronically) as well as correcting it. Finally, we encourage your team to designate a single person to complete the review process and one other person to make the corrections. Involving too many people in this step will only introduce errors. Once the document has gone through careful copyediting and revisions and both the reviewer and the author have made the appropriate changes, the full team should review the complete document one last time before it goes out for external review. Team members may find something that wasn’t apparent in early editing stages, so be prepared to make *small* corrections, additions, or deletions at this step. We hardly need to emphasize that this is not the time to introduce large-scale changes. This time should be reserved for the team to look proudly upon the work they’ve completed and confidently agree that the document is ready for final review.

## 5.5.2 Send Out for a Final Review of Content and Clarity

Once your document is complete—is in a form that you believe is acceptable for submission to the final audience—your team should get one more level of feedback from a very experienced, senior person, ideally somebody external to your organization but not a member of the final audience. The purpose of this step is to receive words of wisdom about the content and clarity of the document prior to the final submission. Often, these reviewers will provide a different perspective from any of the members of

TABLE 5.9. Common Copyediting and Proofreading Symbols

Instruction	Editing Mark (in the line only)	Proofreading Marks (in the line and in the margin)	
Delete	Seattle summers <sup>g</sup> events	Seattle summers <sup>g</sup> events	<sup>g</sup>
Delete and close up	Seattle summer ev <sup>g</sup> ents	Seattle summer ev <sup>g</sup> ents	<sup>g</sup>
Replace	Seattle summer <sup>events</sup> calendar	Seattle summer calendar	events
Insert	Seattle <sup>summer</sup> events	Seattle events	summer
Transpose	Seattle <sup>events</sup> summer	Seattle <sup>events</sup> summer	TR
Insert space	Seattle summer <sup>#</sup> events	Seattle summer events	#
Close up extra space	Seattle summer <sup>^</sup> events	Seattle summer <sup>^</sup> events	extra #
Run together/no new paragraph	She reads. <sup>^</sup> He writes.	She reads. <sup>^</sup> He writes.	run in
Line break	She reads. <sup>^</sup> He writes.	She reads. <sup>^</sup> He writes.	break
Instructions: Don't set what's circled	Seattle summer events <sup>which?</sup>	Seattle summer events <sup>^</sup>	which
Ignore marked changes	Seattle <del>summer</del> events	Seattle <del>summer</del> events	stet
Spell out	<sup>1<sup>st</sup></sup> event	<sup>1<sup>st</sup></sup> event	sp
use symbol	<sup>eleven</sup> summer events	<sup>eleven</sup> summer events	11
Center	<sup>]</sup> Seattle summer events <sup>[</sup>	<sup>]</sup> Seattle summer events <sup>[</sup>	s
Align	<sup>  </sup> Seattle summer events	<sup>  </sup> Seattle summer events	fl
Make italic	<sup>Seattle summer events</sup>	<sup>Seattle summer events</sup>	ital
Make Roman	<sup>rom</sup> Seattle summer events	<sup>Seattle summer events</sup>	rom
Wrong typeface	<sup>Seattle summer events</sup>	<sup>Seattle summer events</sup>	wf
Capitals	<sup>seattle summer events</sup>	<sup>seattle summer events</sup>	daps
Lower case	Seattle <sup>summer</sup> <sup>events</sup>	Seattle <sup>summer</sup> <sup>events</sup>	lc
Superscript	9 <sup>✓</sup>	9 <sup>✓</sup>	supe
Subscript	R <sup>^</sup>	R <sup>^</sup>	sub
Period	Seattle summer events <sup>o</sup>	Seattle summer events <sup>^</sup>	o
Comma	Seattle summer events <sup>^</sup>	Seattle summer events <sup>^</sup>	^
Colon	Seattle summer events <sup>^</sup>	Seattle summer events <sup>^</sup>	^
Semicolon	Seattle summer events <sup>^</sup>	Seattle summer events <sup>^</sup>	^
Quotation marks	<sup>✓</sup> Seattle summer events <sup>✓</sup>	<sup>✓</sup> Seattle summer events <sup>✓</sup>	q/
Apostrophe	Seattle summer events <sup>✓</sup>	Seattle summer events <sup>✓</sup>	✓
Parentheses	(Seattle summer events)	<sup>^</sup> Seattle summer events <sup>^</sup>	(/)

your team, and as an experienced reviewer—a sort of “in house” external reviewer—he or she can read your document with the same critical eye that your ultimate audience will have. This senior person might find places where the logic could be improved or where you should include another reference or two to cement your case, for example. Perhaps your team overlooked a relevant counterargument or didn’t make one of your points confidently enough. A senior reviewer will help improve your document by addressing these sorts of issues.

However, enlisting the help of senior colleagues—either internal or external—must be undertaken with care. Senior people are almost always willing to help others, but your team must clearly articulate the purpose of the review for the senior person and should only submit a final document. Unless your team is completely stuck, submitting a draft to a senior person would be a waste of time because drafts are simply not ready for the level of feedback that you need from an outside reviewer. It’s difficult to comment on the quality of something that is still in formation because the devil is in the details, and the details are not there yet. Naturally, senior people are busy, so be careful to build adequate time into your process so that the reviewer has time to thoughtfully comment on the document and your team has time to make any suggested revisions.

Finally, like nearly every other step in the *STREAM Tools* Writing Process, your team should use this review as one more opportunity to cycle through revisions. Hopefully, your document will only require very superficial modification at this point, but it’s possible that a senior person will point out a significant flaw. If that is the case, the project leader must assign additional writing tasks to a team or teams, and the document will cycle back to the “Writing Stage,” in which each team contributes revisions, the team leader compiles, the whole document is once again reviewed for content and clarity, and then it is copyedited. The external reviewer probably won’t want to see the document again, so your team needs to be very clear about the revisions required if they are significant. Your team should also implement those changes with extreme care, keeping in mind that the person who suggested the changes might not be available to review them as they appear in the new document.

### 5.5.3 Proofread the Document

After carefully incorporating the responses and the final suggestions offered by the senior reviewers, the manuscript should be proofread one more time. Ideally, the proofreaders will not be the same people who wrote the document or contributed to the comprehensive editing. At this point, authors and editors have already had their chance to polish the document and are too likely to miss errors either because they have seen this manuscript too many times or simply because they know what the document says. A person who has only contributed to the copyediting stage would be an acceptable choice, however, to make the final surface changes necessary.

Since the point of proofreading is quality control at the surface level, proofreaders need to be careful not to work to the point of fatigue and must be careful about becoming involved in what the document says. Experienced proofreaders use a variety of techniques not only to reduce fatigue but also to reduce the likelihood that they will be



swept into the document's content. Three common strategies that your team might use are listed below, ordered from most effective to least effective; all work best with a printed document instead of one on a computer screen.

1. *Review with a word window.* Essentially, a word window allows an editor to see only a few words at a time—perhaps half of a line—while concealing the remainder of the page. To use this method, cut a small window about the height of a line of type and about half of a line long into a standard sheet of paper then review each line of the document window by window, beginning with the last page and continuing to the first page. This method produces excellent results, but also requires a great deal of time.
2. *Read one line at a time, backwards.* Similar to the word window technique, using this approach requires a proofreader to look at a single line of text, moving from the end of a document to the beginning. Sometimes covering the text above the line being reviewed is helpful, although experienced proofreaders can mentally mask the lines not being reviewed.
3. *Read from the end of the document to the beginning.* At minimum, review the document from the end to the beginning. When reading backwards it is more difficult to become involved in the content, though it is still possible. Attempt to look at each word and punctuation mark alone without reference to the words earlier in the document.

These strategies, of course, are idealized. In practice, your team members will probably have to move between words or lines because ensuring correctness often means knowing a bit of context. For example, should the word be “there,” “their,” or “they’re?” Only the context can tell a proofreader that. Likewise, most punctuation relies on context, so a proofreader might have to look at multiple lines or words to discern, for example, if a comma appears correctly or if a semicolon would be a better choice.

Microsoft Word contains a host of built-in features that proofread for authors on the fly. These most often appear as the squiggles under words or sentences. While writers can choose to alter the specifics of these features, generally, editors (and authors) can work with the default features. The only exception to this might be setting language, especially if your team comes from diverse English-speaking populations because different countries often spell words differently or have slightly different grammatical conventions. For example, the spelling of “color” is American English but the same word is written “colour” in British English. This is just one example, but others exist. To set the language to the dominant audience dialect (if your team is writing for a journal in the UK, for example, use British English settings), select the **Review** tab on the top of the Microsoft Word interface, then click *Set Language* on the **Proofing** ribbon. This opens a list of languages and dialects, from which you can choose the language that is most appropriate for your audience.

Another commonly used feature of Microsoft Word is the spelling and grammar check. This particular function can be very helpful for editors (and writers) to review their document prior to finalizing it. This function, while useful for helping point out



potential problem areas, should be used with extreme caution because it quite frequently introduces errors if a user simply allows the grammar check to make changes automatically. Even though the grammar check can introduce errors, it is useful for the times it alerts authors and editors to a problem or two that they might have missed. It is worth the time to run as a final step—assuming the author or editor is willing to invest the time in carefully reviewing the grammar check’s suggestions. Once the proofreader has reviewed the changes suggested by any automatic feature, he or she should *always* review the document one last time before submitting it to the audience to confirm that auto-change suggestions have not introduced new errors.

Proofreading can be tedious and time consuming and, because it occurs at the end of the drafting process, writers typically don’t devote enough time to doing it well. However, the superficial errors uncovered in proofreading are the most distracting for readers, and more importantly, detract from the document’s credibility. If the document contains silly mistakes, the audience might come to believe that the data or conclusions fall victim to an equal amount of carelessness. Again, writers should never underestimate the power of superficial appearance. Doing so jeopardizes not only the document’s usability, but more importantly, its credibility.

***STREAM Tools Commandment #9:***

Never underestimate the power of superficial appearance.

### 5.5.4 Submit the Document

*Finally!* Your team has gone through a very thorough process and is now ready to submit the final document to the audience. It seems like an innocent step—just click the button or send a letter. However, a great many projects are ruined at the submission step. As you submit the document, think of potential things that can go wrong on the other side: a Microsoft Word document is complex, sensitive, and vulnerable. Once the file is out of your hands, who knows how much it will change once opened on another person’s computer. Automatic references might disappear, figures might move around, fonts might change, and pagination might be ruined.

Because so many things can go wrong with submission, we encourage you to create an Adobe PDF file from your final Microsoft Word document prior to submission. PDF files usually maintain the formatting of the original document, ensuring that the audience sees the document exactly as you wrote it. Yet, even in PDF format, changes can occur, such as color illustrations rendering in black and white. If your document relies on the power of a color illustration, the document will be much less effective in black white. Therefore, after you have produced the PDF, confirm that the document looks exactly as your team intended it to before you submit it to the audience.

As another example to illustrate how carefully your team must guard your document’s formatting and presentation, imagine a situation in which a single manuscript must be submitted as a collection of individual files (e.g., introduction, background,

etc.). An administrative person might take your single Microsoft Word document and chop it into pieces *before* creating PDFs of each piece. What a nightmare! By chopping up the Microsoft Word document, all of the automatic features of the document will be destroyed, and the PDF versions will replicate all the formatting that was obliterated when the Microsoft Word document was divided. This serves as a lesson *never* to allow an administrative person or someone outside your team to have the final say on how your document looks. To avoid such a scenario, you should create a single PDF file and then use Acrobat's tools to extract the pages into separate files. Be careful to save each extracted section as a unique name so that you don't accidentally overwrite the entire PDF file. Only after you have carefully reviewed each of the separate files for consistency of page numbers, figure references, and other formatting issues should you submit the files or give them to an administrative person to submit.

Thus, beware of the desire of third-party participants to make last-minute changes to the document. Such changes might be necessary, but they need to be strongly justified. At a certain point you have to say "good enough." As the old adage goes, in this case, "better" is the enemy of "good."

***STREAM Tools Commandment #10:***  
***"Better" is the enemy of "good."***

One final, painful element of manuscript submission is meeting publisher requirements. Most publishers do not care how much busy work you will have to endure to meet the requirements that they specify; they would rather leave it as your problem alone. Publishers worry about reducing their production workload, not yours. You may be asked to submit each figure on a separate page, to remove any auto-numbering features, to change spacing between the lines, and so on. We have to admit that, unlike LaTeX, Microsoft Word does not provide a good set of options for these situations. You may have to move your figures towards the end manually or strip auto-text features. For the latter, you can copy portions or the entire document and then paste them as Paste Special, Unformatted text. Whatever you do to make the final document meet the publisher's needs, *be sure to retain a formatted copy* of your document that preserves all automatic features. Do not chop up your original formatted document. Instead, save the formatted document using a new name and submit the new document. This is important because it is quite likely that the publisher will request additional revisions prior to publication, many of which will be easier to make in a fully automated and formatted document.

The publisher's request for revisions leads to our final note about the submission process: you might need to substantially revise the document yet *again* after it has been submitted. For scholarly publications, it's very common that your team will have to "revise and resubmit" the paper. Sometimes a journal or publisher rejects a paper with reviewer feedback that suggests that major revisions are in order. If this unfortunate situation occurs—and it will at some point for every writing team—the team must regroup and return to the beginning of the *STREAM Tools* writing process in order to

assess how, or if, they want to go forward with the document. The team must decide between several options, such as submitting to a new journal, rewriting small sections, or revising extensively and resubmitting to the same publisher. Regardless of the particular review, the team will almost certainly need to cycle back through portions of the writing process to produce a revised document.

Again, we want to emphasize that when writers genuinely internalize that writing is a process as the *STREAM Tools* approach foregrounds, teams will be less devastated when they receive news that they must rewrite the document. It's all just part of the process of producing successful technical writing.

### 5.5.5 Conduct the Final Process-Improvement Review Session

No process is complete without a final review, sometimes called a “post mortem.” Writing projects are no different. In the final review, team members celebrate their success at producing the final product, but they also examine ways that the process could be improved next time. Perhaps team size was too large or the right expertise wasn't in place. Perhaps the editor asked for too many stylistic revisions that slowed the process unnecessarily. Perhaps the writing assignments weren't equitably distributed.

Many people have written about methods and strategies for conducting a post mortem, but most agree on a few key principles that your team should follow:

- *Conduct the review session immediately following the project.* If you wait too long to reflect on the process, then your team will forget crucial elements about the process.
- *Provide a review of the project's details.* Record the project's goals and audience, how long it took, a list of those who were involved, and so on. The purpose is to remind everyone of the project's scope and give everybody recognition for their contributions.
- *Record things that went well, and things that went poorly.* No project is perfect, but all projects have successes if we look for them. Your team should articulate both the positive and negative aspects of the process. Be sure to involve everyone in the process, perhaps drawing out the contributions of junior team members prior to those of senior team members so that the junior contributors do more than just agree with senior members.
- *Create an action plan for the future.* Based on the successes and failures, record both how your team will overcome challenges *and* replicate successes in future projects.
- *Write everything down.* Conducting the post mortem meeting is a great way to bring closure to a project. However, like writing itself, working in project teams should be viewed as a process, and recording the results of the post mortem meeting gives those on your team an action plan for “revising” future team interactions. Share the written report with all the team members and the team's supervisor so that it can be referenced in the future.

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## EXERCISES

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**Exercise 5.1.** For a document that you are working on at this time but have not yet sent to its audience (a report, a memo, even an email), use the *STREAM Tools* Audience Assessment Tool and the *STREAM Tools* Purpose Tool to assess how well you have written the document for its intended audience and purpose. Revise the document according to your assessment and send to the intended audience.

**Exercise 5.2.** Locate the manuscript submission guidelines for a journal in your field (excluding those already referenced in this text). Study the guidelines and, using your knowledge about modifying the *STREAM Tools* template, create a new template for that journal that you might use as you author a manuscript. Upload that template to the *STREAM Tools* website.

**Exercise 5.3.** For the document you used in Exercise 5.1, create a comprehensive style guide for the project using the *STREAM Tools* Style Guide Tool. Then, prepare a style sheet for that same document using the *STREAM Tools* Style Sheet Tool.

**Exercise 5.4.** Think about a document that you must write but haven't yet written. For the entire document, regardless of length, create an outline using Microsoft Word. After completing the outline, add some dummy text to the sections, and create a table of contents by selecting the **References Ribbon**, and then **Table of Contents**.

**Exercise 5.5.** Ask a friend or colleague for a manuscript that has been recently drafted but has not yet reached its final form. Using the *STREAM Tools* Editorial Questions Tool and the *STREAM Tools* Editorial Mark-up Table edit the document, providing commentary that your friend or colleague can use to improve the document.

**Exercise 5.6.** Get together the advisor and advisee in your organization and go together through the STEM table entries. Pick the feedback codes that you find most useful, and discuss which additional codes would be helpful. For example, we often use codes like "c:\MA2," which indicates that the advisee should read Chapter 2 of Michael Alley's book on scientific writing before proceeding).

## ADDITIONAL RESOURCES

- Alley, Michael (1996). *The Craft of Scientific Writing*. New York: Springer-Verlag.
- Dragga, Sam and Gwendolyn Gong (1989). *Editing: The Design of Rhetoric*. Amityville, NY: Baywood Publishing.
- Rude, Carolyn (1998). *Technical Editing*. Needham Heights, MA: Allyn and Bacon.
- Weber, Jean Hollis (1999). *Electronic Editing: Editing in the Computer Age*. WeberWoman's Wrevenge: Henderson, NV.