



MERRIMACK COLLEGE

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# Technical Report Basics

A Guide for the Sciences

Merrimack College Writing Center

# Goals

- Understand Style Guides
- Develop a sense of the terminology and issues related to writing in some of the sciences, especially Chemistry.
- Develop an approach to writing technical documents.



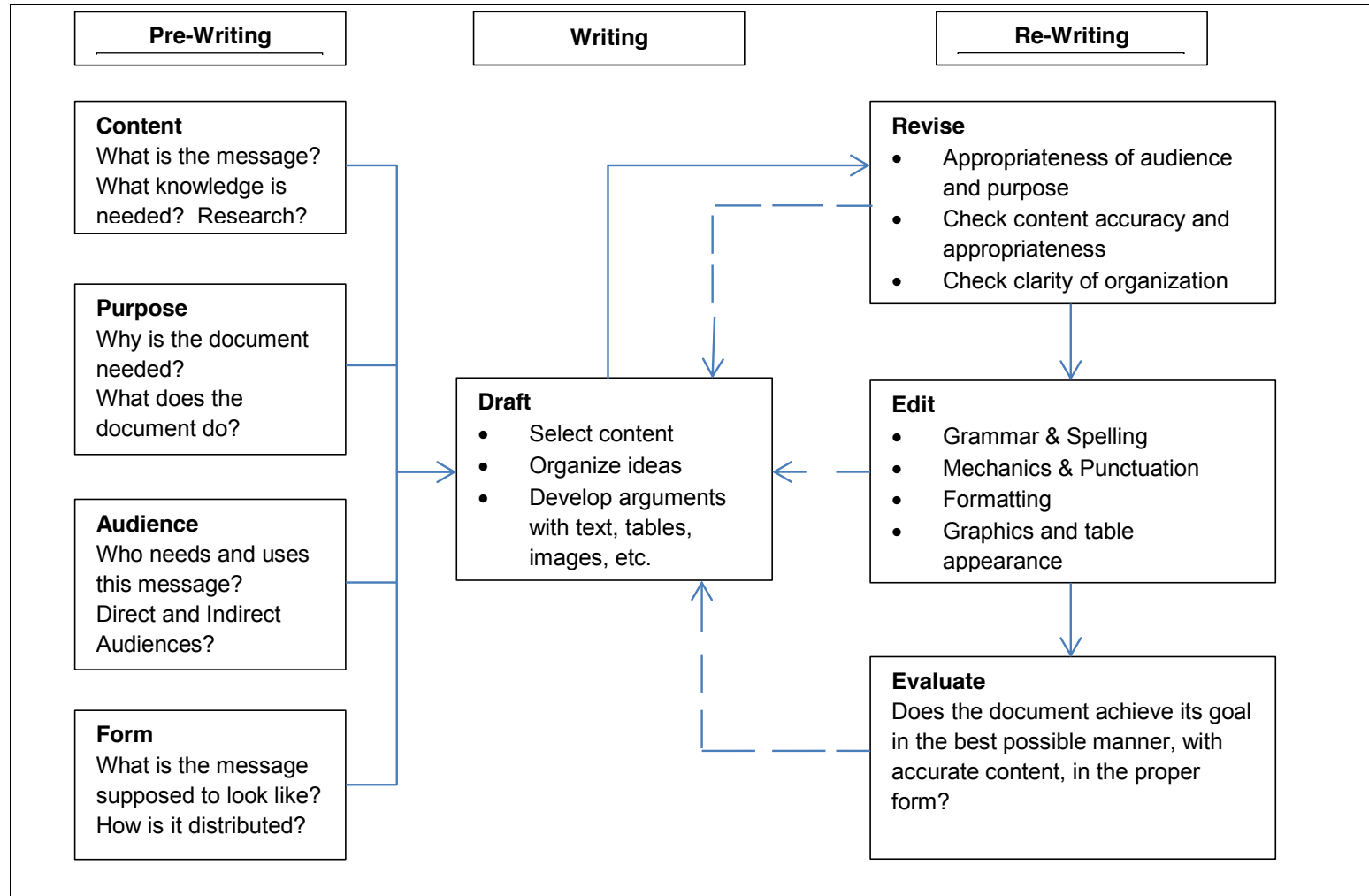
# About Style Guides

- A Style Guide sets expectations your reader will have for your writing.
- In the professional workplace, you will encounter other style guides as well
  - Some are disciplinary, such as MLA, APA, Chicago, or ACS.
  - Others are specific to the corporations or business who created them.
  - Federal and state agencies will also likely have style and content expectations and guidelines for technical writers in industrial hygiene.
- The larger the corporation or government office, the more likely they are to have a style guide of their own.
- Always remember that the style of *your* workplace, and the accompanying guidelines from federal or state authorities, supersede any grammar or style lessons learned in school.



# Technical Report Writing Process

Figure 1. Technical Document Writing Process



# Technical Report Parts

- Reports in general, including technical reports, have a standard form in which the content is expected to be presented.
- Remember that form follows function, so understanding *what* your paper will do always helps determining the *content* that should be included and *form* the report should take.
  - A *technical report* explains how a study (design, experiment, analysis, or otherwise) was accomplished.
  - The *experimental report* outlined below is specific to experimental activities,
  - The *analytical report*, like the experimental report, is simply another specific type of technical report.
  - Finally, a *technical paper* is a post experiment document generally written for conferences and publication.



# Technical Report Parts

*Table 1. Comparison of Report Types and Content*

Technical Report	Experimental Report	Analytical Report	Technical Paper
Opening Matter Title and Author Table of Contents List of Figures List of Tables Abstract / Summary	Opening Matter Title and Author Abstract or Summary	Opening Matter Title and Author Abstract or Summary	Opening Matter Title and Author Abstract or Summary
Introduction	Introduction	Introduction Background Purpose	Introduction Background
Background			
Objectives			
Proposed Solutions	Purpose		
Procedures	Procedures	Methodology / Procedures	
	Basic Theory	Limitations	
Results	Data & Results	Data & Results	Current Study
Discussion	Discussion	Discussion	Results & Discussion
Conclusions	Conclusions	Conclusions	Conclusions
Recommendations	Recommendations	Recommendations	Recommendations
References	References	References	References
Appendices	Appendices	Appendices	Appendices

Notice the extensive overlap across these report types. Technical writers should know what each of these sections are, what they do, and how they are written. In addition to technical writing guides, journals in the discipline provide illustrations of how these components are written and fit together.

# Document Formatting

- Consider multiple column or other layout changes, if more than 65 characters appear in a line. Longer lines slow the reading.
- Justify only the left hand margin. Right hand justification reduces readability.
- Break dense copy into more readable, smaller sections. Shorter paragraphs are easier to follow.
- Use white space to make the text clearer and easier to read.
- Be consistent in font type, size, spacing, margins, and other document features.



# Headings

- Headings are strategic statements or phrases that teach your reader how to navigate your document and find information fast.
  - Use headings to identify major sections and / or subsections.
  - Unless otherwise required, use details that make headings self-explanatory.
    - Nuclear Power Station Cooling Systems (good) vs. Plant Systems (unclear)
  - Be consistent in capitalization, emphasis (bold, italics, underline), indentation, and punctuation for each *level* of heading.
  - In general, headings apply to multi-paragraph sections; avoid using them for one-paragraph sections whenever possible.
  - Use parallel phrasing for headings.





# Headings (Continued)

- Be certain to cover the range of information in a heading.
  - Nuclear Cooling Design (good) vs. Nuclear Cooling (ignores the emphasis on design)
- Do not stack headings. Always include content.
- Avoid lone headings – having only one of a heading in a section.
- Avoid referring to headings in the text (pronoun referrals).
- Avoid starting headings with articles.
- Do not use headings to lead into lists, figures, etc.
- Avoid “widow” headings (standing alone at the bottom of a page); force the heading to the top of the next page.



# Style and Grammar Philosophy

- When considering style and grammar, err on the side of preciseness and conciseness: say exactly what you mean, as briefly as possible.
- This is not a comprehensive list of all rules and guidelines, only a compilation of those tips most often needed.
- Consult a grammar and style handbook for more suggestions, and remember: your corporate, agency, or institutional style guide supersedes all other rules.



# Style

- After 23 words, no one is reading (unless the technical jargon or terminology of the discipline mandates longer sentences).
  - “A concentration of [chemical compound] was [specialized verb with a chemistry-specific definition]...”.
- Avoid jargon when possible.
- Avoid excessive anecdotes and evidence.
- Avoid repeating what people know.
- When using positive and negative statements, cut the negative.
- Unless it is expected in your field, avoid wording that makes the researcher sound indifferent to what is occurring.
  - “When it is assumed...” (sounds like no one has made the assumption) vs. “If...then...” (active involvement of researcher)
- Do not substitute generic terms “chemical compound A”, etc., when the name of the compound is appropriate. This will improve clarity.
- Define abbreviations and acronyms by first using the full name, then following it with a parenthetical containing the shortened form. The term may be used thereafter.
  - “The American Chemical Society (ACS)...”
- Idioms, slang, and humor can confuse non-native readers. Use global icons and terminology, much of which is available through the International Organization for Standardization. (<http://www.iso.org>)



# Grammatical Structure

- Subject/agent first, then verb/action – emphasis is almost always on the subject.
  - “chemicals reacted” (good) vs. “the reaction from the chemicals was...”
- Avoid nominalizations – turning verbs into nouns
  - “The presentation offered a solution...” (poor) vs. “He presented a solution...” (good)
- Reduce passive voice (is, are, was, were). In some chemical methodologies and discussions, this may not be acceptable or practical. Check for appropriateness in other sections of the document.
  - “The solution was added by the assistant” vs. “the assistant added the solution”
  - “...a solution was added...” (may not be acceptably removed)
- Avoid long compound noun phrases. Identify the noun quickly, and get to the action.
- Use sentence beginnings to connect to prior or shared knowledge.
  - “...resulted in a compound of three chemicals. This compound...”
- Use transitional or orienting words in sentence beginnings.
- Reduce wordiness by eliminating unnecessary words and converting prepositional phrases to adjectives.
  - (red in color vs. red – when is red *not* a color?)
- “the composition of the compound” vs. “the compound composition”



# Punctuation

- Semicolons
  - Separate independent clauses that do not use coordinating conjunctions.
  - Separate independent clauses that contain conjunctive adverbs (however, hence, etc.).
  - Separate items in series that already contain commas.
- Colons
  - Introduce a word, phrase or clause that amplifies a general statement.
  - Set off a series preceded by an independent clause.
- Commas
  - Separate independent clauses that use coordinating conjunctions.
  - Set off introductory statements of four or more words
  - Set off items in sequence
  - Set off appositives and non-essential phrases and clauses
  - May be used to clarify confusing grammar.



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