TECHNICAL
COMMUNICATION

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CHAPTER 1
INTRODUCTION TO TECHNICAL COMMUNICATION

1.1 WHAT IS TECHNICAL COMMUNICATION?

Technical communication is an audience-centered means of communication that provides the reader with clear, accurate, and ethically represented information. According to the Society for Technical Communication, this type of communication includes the following characteristics:

- "Communicating *about technical or specialized topics*, such as computer applications, medical procedures, or environmental regulations."

- "Communicating *by using technology*, such as web pages, help files, or social media sites."

- "Providing *instructions about how to do something*, regardless of how technical the task is or even if technology is used to create or distribute that communication."

ACADEMIC WRITING VS. TECHNICAL COMMUNICATION

Technical communication is distinct from the academic forms of writing you may be more familiar with. The academic writer's purpose may be to write an essay, a story, a research paper, etc. Such assignments are often designed so that students can "write to learn" and show mastery of information covered in class. These works may or may not have an audience other than the professor.

Technical communication, however, is intended for another purpose. These documents convey information to audiences who may or may not have prior knowledge of the material discussed. Technical communicators must therefore determine the needs of their audience and design documents that convey information in an accessible and appropriate manner. Depending on the context of communication, it might also be necessary to convey information

in a concise and efficient manner, succinctly presenting points and cutting extraneous or potentially distracting material.

VISUAL FORMATTING AND EXPLANITORY LANGUAGE

Another key difference that distinguishes technical communication from academic writing is the importance of visual formatting and explanatory language. Visual formatting and explanatory language are the basic design elements of technical documents. Visual formatting—e.g., headings, subheadings, or a table of contents—shows the hierarchical structure of information and orients the reader within a text. Explanatory or descriptive language provides the reader with a clear understanding of the information discussed. This type of language can include explicit details of technical information as well as information about the purpose of the document, how the document relates to the reader's needs, and what action is expected of the reader.

Visual formatting and explanatory language make technical documents functional and easy to navigate. For example, if a technical report details funding for numerous departments, the superintendent for a particular department might not want to read the entire document. Instead, the superintendent may choose to only read the sections pertaining to his or her department. A well-designed technical document should enable a reader to scan through the document and easily find and comprehend the sections relevant to his or her needs.

You may have experienced a similar scenario when flipping through a user manual, another example of technical communication. Instead of reading the entire manual when setting up a device or troubleshooting during an emergency, you probably scan the index and headings to find relevant sections. A well-written user manual will include sections that clearly and succinctly present information and enable you to effectively complete your desired task.

Other characteristics common to technical communication include specialized terminology, abbreviations, equations, images, and graphics (tables, graphs, figures, etc.).

MANAGING COMPLEXITY

Visual formatting and explanatory language are also needed in technical communication to effectively represent complex information. Rarely does a complex idea have a simple structure. For example, an analysis of water usage might span multiple countries, lake and river usage, irrigation and power generation, political implications, infrastructure, and technology. All of these dimensions are interconnected. You will need to make choices about

what information to include, how to organize this information, and how to clearly express connections between complex and multifaceted issues. Many arrangements will be possible. The right arrangement is the one that best fits the audience, context, and purpose of your document.

LICENSES AND ATTRIBUTIONS

Hall, E. T. & Hall, M. R. (1990). *Understanding Cultural Differences.* Yardmouth: Intercultural Press, Inc.

Riordan, D. G. (2005). *Technical Report Writing Today.* Boston: Houghton Mifflin Company.

"What is Technical Writing" by Dr. Elizabeth Lohman licensed under (CC BY 4.0).

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1.2 WHO IS YOUR AUDIENCE & WHAT IS THE RHETORICAL CONTEXT?

AUDIENCE AND RHETORICAL CONTEXT

It is your responsibility as the writer to provide your readers with clear and easy access to needed information. To do this you must know the needs of your audience. This is easier said than done. You will often have to compose documents for multiple audiences, often with different needs or levels of knowledge. Your audience is also not static; the composition of your audience and their needs can change depending upon the context of communication.

To create effective technical documents, consider multiple factors, such as the needs of the audience, the particulars of the message, and your credibility as an author. Paying attention to these factors and how they intersect will give you insight into the rhetorical context of the communication.

The following video will teach you how to analyze audience and craft technical documents with the rhetorical context in mind.

This video features the "Audience Rhetorical Approach" by Dr. Kim Campbell licensed under (CC BY-ND 3.0).

TYPES OF AUDIENCES

When preparing documents, it is important to remember potential audiences for your work. Awareness of the differences between intended and unintended audiences may impact how an author presents or includes information in a document, and may make a difference in the event of a legal issue concerning the document. Awareness of complex audiences will further ensure that an author's writing does not exclude potential readers. You do not want to neglect an important figure if he or she needs to be addressed in your document.

INTENDED VS. UNINTENDED AUDIENCE

Intended audiences are best thought of as the people you are initially writing for; they are the obvious and immediate audience for your document. However, you may have to consider unintended audiences for your document as well. Unintended audiences may be anyone who comes across your writing at any point in time. Digital and printed documents can circulate beyond the intended audience, and your writing may be misconstrued outside of its original context.

Especially in business contexts, it is a good rule of thumb—as well as in your best interest legally—to remain professional in every document you produce.

COMPLEX AUDIENCE

In professional settings, you will often write for a complex audience of people who have different backgrounds, experiences, specialties, and expectations. You must carefully attend to features of your writing like technical terminology so that you don't unintentionally exclude a portion of your audience. You might also need to design documents that audiences can quickly scan and locate sections relevant to them.

Writing for complex audiences is a difficult task that requires both practice and careful attention to the nuances of your audience and the rhetorical context.

TAILORING EMPLOYMENT DOCUMENTS FOR A COMPLEX AUDIENCE

A quick example of writing for a complex audience can be seen in employment documents such as a resume or cover letter. First, in employment documents there is no such thing as "one size fits all." Each resume or cover letter should be individually tailored for a specific job and company. All-purpose resumes can be easily spotted and it is easier to make a positive first impression if your materials are specifically relevant for the job and company you are applying to.

You also need to keep in mind that multiple individuals, with a range of backgrounds and experience levels, will likely read your employment materials. Your documents might also be reviewed by software like applicant tracking systems. You must keep this complex audience in mind when creating materials that clearly describe your qualifications.

To create effective employment materials, it helps to research the company and position. Some ways that this can be done include the following

- *Looking at the job description* – The job description usually gives a set of skills that will be required for the position. The skills outline what the employer is looking for and therefore what should be added to the

resume. (One should never lie about applicable skills; instead **highlight** and **prioritize** desired skills so that they stand out).

- *Looking at the company website* – Looking at the company's website can help with understanding the company culture and values that may not be listed in a job description. This can be beneficial when writing a cover letter, where it is important to acknowledge the potential employer.

In addition to looking at the job description and company website, it is helpful to consider the type of job that you are applying for. If, for example, you are applying for a job in a design field, you might want to tailor your resume to be more creative and avoid using a generic template.

It is important to remember that in employment documents you are selling yourself. Each job will be slightly different, so it is crucial to tailor your resume to the employer. Emphasize your relevant qualifications and highlight your fit for the position. Additionally, make sure your documents are not cluttered with information the employer may find unnecessary.

LICENSES AND ATTRIBUTIONS

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CHAPTER 2

DESIGN ELEMENTS

2.1 HOW DO YOU EFFECTIVELY DESIGN DOCUMENTS?

DESIGNING READER-CENTERED PAGES AND DOCUMENTS

You build your communications out of visual elements: the dark marks of your words, sentences, and paragraphs against the light background of the page, as well as your drawings and graphs and tables. Your readers see the visual design of these elements before they read and understand your message. And what they see has a powerful effect on the success of your communications, on its usability and persuasiveness.

Here are ways that good design enhances usability.

- Good design helps readers understand your information.
- Good page design helps readers locate information quickly.
- Good design helps readers notice highly important content.

Here are some ways good design affects readers' attitudes, thereby increasing a communication's persuasiveness.

- Good design encourages readers to feel good about the communication itself.
- Good design encourages readers to feel good about the communication's subject matter.

A READER-CENTERED APPROACH TO DESIGN

Because page design can have such a significant impact on your communication's usability and persuasiveness, you should approach design in the same reader-centered manner that you use when drafting text and graphics. Think continuously about your readers, including who they are, what they want from your communication, and the context in which they will be reading.

DESIGN ELEMENTS OF COMMUNICATION

It is helpful to think about the building blocks of a page design in the way that professional graphic designers do. When they look at a page, they see six basic elements:

1. **Text:** Paragraphs and sentences.

2. **Headings and Titles:** Labels for sections of your communication.

3. **Graphics:** Drawings, tables, photographs, and so on — including their captions.

4. **White Space:** Blank areas.

5. **Headers and Footers:** The items, such as page numbers, that occur at the top or bottom of each page in a multi-page document.

6. **Physical Features:** These include paper, which may take many shapes and sizes, and bindings, which come in many forms.

CREATING GRAPHICS

PLANNING

1. Identify places where graphics will increase your communication's usability.

2. Identify places where graphics will increase your communication's persuasiveness.

Note: Make sure not to add graphics to areas that will alter the flow of the document/communication. Add graphics in places in between paragraphs or other logical breaks in the document.

SELECTING

1. Select the types of graphics that will best support your readers' tasks.

2. Select the types of graphics that will effectively influence your readers' attitudes.

3. Select the types of graphics that will best support your case.

DESIGNING

1. Design graphics that are easy to understand and use.

2. Design them to support your readers' tasks.

3. Design graphics that your readers will find persuasive.

4. Keep your graphics simple enough for easy use.

5. Label content clearly.

6. Provide your graphics with informative titles.

7. Address the graphics with a summary of results or caption about the graphic.

USING COLOR

1. Use colors to support your message.

2. Use color for emphasis, not decoration or too distracting from the body text.

3. Choose a color scheme, not just individual colors.

4. Provide high contrast between text and background.

5. Select colors with appropriate associations.

6. Limit the number of colors.

7. Use color to unify the overall communication.

INTEGRATING WITH THE TEXT

1. Introduce each graphic in the text first.

2. Tell your readers the conclusions you want them to draw from the graphic.

3. Provide all explanations your readers will need in order to understand and use each graphic.

4. Locate each graphic near its references.

ADDRESSING AN INTERNATIONAL AUDIENCE

1. Check your graphics with persons from other nations for clarity when possible.

2. Check your graphics with technology for problems when intra-converted between computer systems.

USING GRAPHICS ETHICALLY

1. Avoid elements that might mislead your readers.

2. Obtain permission from the copyright owner of each image that is not in the public domain.

3. Give credit to all involved in the development or research of the graphic.

4. Be sure the graphic will benefit the document overall and will not just add unnecessary clutter.

LICENSES AND ATTRIBUTIONS

"General Design Concepts" by WikiBooks licenced under (CC BY-SA 4.0)

"Designing Reader Centered-Pages and Documents" by WikiBooks licenced under (CC BY-SA 4.0)

ADDITIONAL SOURCES FOR FORMATTING:

"Headings: How to Make Your Text Scannable" by David McMurrey licensed under (CC BY 4.0).

2.2 HOW DO YOU ORGANIZE INFORMATION?

The purpose of business writing is to communicate facts and ideas. In order to accomplish that purpose, each document has key components that need to be present in order for your reading audience to understand the message. These elements may seem simple to the point that you may question how any writer could neglect them. But if you take note of how often miscommunication and misunderstanding happen, particularly in written communications, you will realize that it happens all the time. Omission or neglect may be intentional, but it is often unintentional; the writer assumes (wrongly) that the reader will easily understand a concept, idea, or the meaning of the message.

From background to language, culture to education, there are many variables that come into play and make effective communication a challenge. The degree to which you address these basic elements will increase the effectiveness of your documents. Each document must address the following:

- Who
- What
- When
- Where
- How
- (And sometimes) Why

If you have these elements in mind as you prepare your document, it will be easier to decide what to write and in what order. They will also be useful when you are reviewing your document before delivering it. If your draft omits any one of these elements or addresses it in an unclear fashion, you will know what you need to do to fix it.

Another way to approach organizing your document is with the classical proofs known as *ethos*, *logos*, and *pathos*. Ethos, or your credibility, will come through with your choice of sources and authority on the subject(s). Your logos, or the logic of your thoughts represented across the document, will allow the reader to come to understand the relationships among who, what, where, when, and so forth. If your readers cannot follow your logic they will lose interest, fail to understand your message, and possibly not even read it at all. Finally, your pathos, or passion and enthusiasm, will be reflected in your design and word choices. If your document fails to convey enthusiasm for the subject, how can you expect the reader to be interested? Every document, indeed every communication, represents aspects of these classical elements.

GENERAL PURPOSE AND THESIS STATEMENTS

No matter what your business writing project involves, it needs to convey some central idea. To clarify the idea in your mind and make sure it comes through to your audience, write a thesis statement. A thesis statement, or central idea, should be short, specific, and to the point. Steven Beebe and Susan Beebe (1997, p. 121-122) recommend five guiding principles when considering your thesis statement. The thesis statement should

1. be a declarative statement;
2. be a complete sentence;
3. use specific language, not vague generalities;
4. be a single idea;
5. reflect consideration of the audience.

This statement is key to the success of your document. If your audience has to work to find out what exactly you are talking about, or what your stated purpose or goal is, they will be less likely to read, be influenced, or recall what you have written. By stating your point clearly in your introduction, and then referring back to it in the body of the document and at the end, you will help your readers to understand and remember your message.

ORGANIZING PRINCIPLES

Once you know the basic elements of your message, you need to decide in what order to present them to your audience. A central organizing principle will help you determine a logical order for your information. One common organizing principle is chronology, or time: the writer tells what happened first, then what happened next, then what is happening now, and, finally, what is expected to happen in the future. Another common organizing principle is comparison: the writer describes one product, an argument on one side of an issue, or one possible course of action; and then compares it with another product, argument, or course of action.

In deciding how to organize your report, you have several challenges and many possibilities of different organizing principles to use. Part of your introduction will involve a historical perspective, and a discussion of the events that led from the First Transcontinental Railroad to the TransAmerica Transportation System proposal. Other aspects will include comparing the old railroad and highway systems to the new ones, and the transformative effect this will have on business and industry. You will need to acknowledge the complex relationships and challenges that collaboration has overcome, and highlight the common benefits. You will be called on to write informative documents as part of a public relations initiative, persuasive essays to underscore the benefits for those who prefer the status quo, and even write speeches for celebrations and awards.

As an example, let's imagine that you are a business writer within the transportation industry and you have been assigned to write a series of informative pieces about an international initiative called the "TransAmerica Transportation System Study." Just as the First Transcontinental Railroad once unified the United States from east to west, which was further reinforced by the Interstate Highway System, the proposed TransAmerica Transportation System will facilitate integrating the markets of Mexico, the United States, and Canada from north to south. Rail transportation has long been an integral part of the transportation and distribution system for goods across the Americas, and its role will be important in this new system.

The table below, "Organizing Principles," lists seventeen different organizing principles and how they might be applied to various pieces you would write about the TransAmerican Transportation System. The left column provides the name of the organizing principle. The center column explains the process of organizing a document according to each principle, and the third column provides an example.

Table 1: Organizing Principles

	Organizing Principle	Explanation of Process	Example
1.	Time (Chronological)	Structuring your document by time shows a series of events or steps in a process, which typically has a beginning, middle, and end. "Once upon a time stories" follow a chronological pattern.	Before the First Transcontinental Railroad, the events that led to its construction, and its impact on early America. Additional examples may include the national highway projects and the development of reliable air freight. Now we can consider the TransAmerica Transportation System and the similar and distinct events that led us to today.
2.	Comparison	Structuring your document by comparison focuses on the similarities and/or differences between points or concepts.	A comparison of pre– and post–First Transcontinental Railroad America, showing how health and life expectancy improved with the increased access to goods and services. Another example could be drawn from air freight, noting that organ donation in one part of the country can now save a life in another state or on the opposite coast. In a similar way, the TransAmerica Transportation System will improve the lives of the citizens of Mexico, the United States, and Canada.
3.	Contrast	Structuring your document by using contrasting points highlights the differences between items and concepts.	A contrast of pre– and post–First Transcontinental Railroad America showing how much time it took to communicate via letter, or how long it took to move out West. Just in time delivery and the modern highway system and trucking may serve as an example for contrast. The TransAmerica Transportation System will reduce customs clearing time while increasing border security along the distribution network.

4.	Cause and Effect	Structuring your document by cause and effect structuring establishes a relationship between two events or situations, making the connection clear.	The movement of people and goods out West grew considerably from 1750 to 1850. With the availability of a new and faster way to go West, people generally supported its construction. Both the modern highway and air transportation systems may serve as examples, noting how people, goods, and services can be delivered in drastically reduced time frames. Citizens of all three countries involved have increasingly been involved in trade, and movement across common borders through the TransAmerica Transportation System will enable the movement of goods and services with great efficiency.
5.	Problem and Solution	Structuring your document by problem and solution means you state the problem and detail how it was solved. This approach is effective for persuasive speeches.	Manufacturers were producing better goods for less money at the start of the Industrial Revolution, but they lacked a fast and effective method of getting their goods to growing markets. The First Transcontinental Railroad gave them speed, economy, and access to new markets. Highways and air routes have dramatically increased this trend. In a similar way, this new system is the next evolutionary step in the integration and growth of our common marketplaces.
6.	Classification (Categorical)	Structuring your document by classification establishes categories.	At the time the United States considered the First Transcontinental Railroad, there were three main types of transportation: by water, by horse, and by foot. Now rail, road, and air transportation are the norm across business and industry.

7.	Biographical	Structuring your document by biography means examining specific people as they relate to the central topic.	1804: Lewis and Clark travel 4,000 miles in over two years across America 1862: President Lincoln signs the Pacific Railroad Act 1876: The Transcontinental Express from New York arrives in San Francisco with a record-breaking time of 83 hours and 39 minutes 2009: President Obama can cross America by plane in less than 5 hours - So why shouldn't the ratio of time from import to consumer be reduced?
8.	Space (Spatial)	Structuring your document by space involves the parts of something and how they fit to form the whole.	A train uses a heat source to heat water, create steam, and turn a turbine, which moves a lever, causing a wheel to move on a track. A package picked up from an office in New York in the morning is delivered to another in Los Angeles in the afternoon. From a Pacific port in Northern Mexico to a market in Chicago or Canada, this system unifies the movement of goods and services.

9. Ascending and Descending	Structuring your document by ascending or descending order involves focusing on quantity and quality. One good story (quality) leads to the larger picture, or the reverse.	A day in the life of a traveler in 1800. Incremental developments in transportation to the present, expressed through statistics, graphs, maps, and charts. A day in the life of a traveler in 1960, 1980, or even 2000, with visual examples of changes and trends may also contribute to the document. A day in the life of a traveler in 2009 compared to the relatively slow movement of goods and services, constrained by an antiquated transportation network that negatively impacts efficiency.
10. Psychological	It is also called "Monroe's Motivated Sequence" (Ayres & Miller, 1994).Structuring your document on the psychological aspects of the audience involves focusing on their inherent needs and wants. See Maslow (1970) and Schutz (1966). The author calls attention to a need, then focuses on the satisfaction of the need, visualization of the solution, and ends with a proposed or historical action. Useful for a persuasive message.	When families in the year 1800 went out West, they rarely returned to see family and friends. The country as a whole was an extension of this distended family, separated by time and distance. The railroad, the highways, and air travel brought families and the country together. In the same way, common markets already exist across the three countries, but remain separated by time, distance, and an antiquated system scheduled for significant improvement.

11.	Elimination	Structuring your document using the process of elimination involves outlining all the possibilities.	The First Transcontinental Railroad helped pave the way for the destruction of the Native American way of life in 1870. After examining treaties, relocation and reservations, loss of the buffalo, disease, and war, the railroad can be accurately considered the catalyst for the end of an era. From the lessons of history we can learn to protect and preserve our distinct cultures, languages, and sovereign territories as we integrate a common transportation system for our mutual benefit and security.
12.	Example	Structuring your document by example involves providing vivid, specific examples (as opposed to abstract representations of data) to support main points	Just as it once took weeks, even months, for a simple letter to move from coast to coast, goods and services have had a long and arduous process from importation to market. For example, the popular Christmas toy X, imported to Mexico from China in September, may well not be on store shelves by December 25 under the old system. Now it can move from importation to market in under two weeks.
13.	Process and Procedure	Structuring your document by process and procedure is similar to the time (chronological) organizational pattern with the distinction of steps or phases that lead to a complete end goal. This is often referred to as the "how-to" organizational pattern.	From conception to design, manufacturing to packaging, to transportation and inspection, to sales and sales support, let's examine how the new transportation system facilitates increased efficiency in delivery to market and product support.

14. Point Pattern	Structuring your document in a series of points allows for the presentation of diverse assertions to be aligned in a cohesive argument with clear support.	The TransAmerica Transportation System offers several advantages: security, speed, efficiency, and cost reduction.
15. Definition	Structuring your document with a guiding definition allows for a clear introduction of terms and concepts while reducing the likelihood of misinterpretation.	The TransAmerica Transportation System can be defined by its purpose, its integrated components, and its impact on the secure movement of goods and services across common borders.
16. Testimonial	Structuring your document around a testimony, or first person account of an experience, can be an effective way to make an abstract concept clearer to an audience.	According to Ms. X, owner of InterCountry Trading Company, it previously took 12 weeks to import, clear, and deliver a product from Mexico to the United States, and an additional four weeks to take delivery in Canada. Now the process takes less than two weeks.
17. Ceremonial (Events, Ceremonies, or Celebrations)	Structuring your document by focusing on the following:	Thanking the representatives, builders, and everyone involved with the construction of the TransAmerica Transportation System. The railroad will unite America, and bring us closer in terms of trade, communication, and family. Thank you for participating in today's dedication.

OUTLINES

Chances are you have learned the basic principles of outlining in English writing courses: an outline is a framework that organizes main ideas and subordinate ideas in a hierarchical series of roman numerals and alphabetical letters. The right column of Table 2 "Outline 1" presents a generic outline in a classical style. In the left column, the three main structural elements of an informative document are tied to the outline. Your task is to fill in the right column outline with the actual ideas and points you are making in your writing project. Feel free to adapt and tailor it to your needs, depending on the specifics of your report, letter, or other document.

Table 2: Outline 1

Introduction	Main Idea
Body	I. Main Idea: Point 1 Subpoint 1 A. 1 specific information 1 A. 2 specific information 2
Body	II. Main idea: Point 2 Subpoint 1 B. 1 specific information 1 B. 2 specific information 2 III. Main idea: Point 3 Subpoint 1 C.2 specific information 1 C.2 specific information 2
Conclusion	Summary: Main points 1–3

Table 3 "Outline 2" presents an alternate outline form that may be more suitable for brief documents like letters and e-mails. You can use this format as a model or modify it as needed.

Table 3: Outline 2

Introduction	Main Idea
1. Introduction	General purpose, statement, or thesis statement
2. Body	Point 1: Point 2: Point 3:
3. Conclusion	Summarize main points

PARAGRAPHS

Paragraphs are how we package information in business communication, and the more efficient the package, the easier the meaning can be delivered.

You may wish to think of each paragraph as a small essay within a larger information platform, defined by a guiding thesis and an organizing principle. The standard five-paragraph essay format used on college term papers is mirrored in individual paragraphs. Often college essays have minimum or maximum word counts, but paragraphs hardly ever have established limits. Each paragraph focuses on one central idea. It can be as long or as short as it needs to be to get the message across, but remember your audience and avoid long, drawn-out paragraphs that may lose your reader's attention.

Just as a document generally has an introduction, body, and conclusion, so does a paragraph. Each paragraph has one idea, thought, or purpose that is stated in an introductory sentence. This is followed by one or more supporting sentences and concluded with a summary statement and transition or link to the next idea, or paragraph. Let's address each in turn:

- The topic sentence states the main thesis, purpose, or topic of the paragraph; it defines the subject matter to be addressed in that paragraph.

- Body sentences support the topic sentence and relate clearly to the subject matter of the paragraph and overall document. They may use an organizing principle similar to that of the document itself (chronology, contrast, spatial) or introduce a related organizing principle (point by point, process or procedure).

- The conclusion sentence brings the paragraph to a close; it may do this in any of several ways. It may reinforce the paragraph's main point, summarize the relationships among the body sentences, and/or serve as a transition to the next paragraph.

EFFECTIVE SENTENCES

We have talked about the organization of documents and paragraphs, but what about the organization of sentences? You have probably learned in English courses that each sentence needs to have a subject and a verb; most sentences also have an object. There are four basic types of sentences: declarative, imperative, interrogative, and exclamatory. Here are some examples:

- **Declarative** – You are invited to join us for lunch.

- **Imperative** – Please join us for lunch.

- **Interrogative** – Would you like to join us for lunch?

- **Exclamatory** – I'm so glad you can join us!

Declarative sentences make a statement, whereas interrogative sentences ask a question. Imperative sentences convey a command, and exclamatory sentences express a strong emotion. Interrogative and exclamatory sentences are easy to identify by their final punctuation, a question mark and an exclamation point, respectively. In business writing, declarative and imperative sentences are more frequently used.

There are also compound and complex sentences, which may use two or more of the four basic types in combination:

- **Simple sentence** – Sales have increased.

- **Compound sentence** – Sales have increased, and we have the sales staff to thank for it.

- **Complex sentence** – Although the economy has been in recession, sales have increased.

- **Compound complex sentence** – Although the economy has been in recession, sales have increased, and we have sales staff to thank for it.

In our simple sentence, "sales" serves as the subject and "have increased" serves as the verb. The sentence is an independent clause, able to stand alone, because it has the two basic parts that constitute a complete sentence—a subject and a verb. In our compound sentence we have two independent clauses that could stand alone; they are joined by a comma and the conjunction "and." In our complex sentence, we have an independent clause, "sales have increased," combined with a dependent clause, "although the economy has been in recession." Adding the subordinate conjunction "although" turns the otherwise independent clause "the economy has been in recession" into a dependent clause that cannot stand alone. Complex compound sentences combine at least two independent clauses and a dependent clause.

The ability to write complete, correct sentences is like any other skill—it comes with practice. The more writing you do, as you make an effort to use correct grammar, the easier it will become. Reading audiences, particularly in a business context, will not waste their time on poor writing and will move on. Your challenge as an effective business writer is to know what you are going to write and then to make it come across, via words, symbols, and images, in a clear and concise manner.

Sentences should avoid being vague and focus on specific content. Each sentence should convey a complete thought; a vague sentence fails to meet this criteria. The reader is left wondering what the sentence was supposed to convey.

- **Vague** – We can facilitate solutions in pursuit of success by leveraging our core strengths.

- **Specific** – By using our knowledge, experience, and capabilities, we can achieve the production targets for the coming quarter.

Effective sentences also limit the range and scope of each complete thought, avoiding needless complexity. Sometimes writers mistakenly equate long, complex sentences with excellence and skill. Clear, concise, and often brief sentences serve to communicate ideas and concepts in effective and efficient ways that complex, hard-to-follow sentences do not:

- **Complex** – Air transportation features speed of delivery in ways few other forms of transportation can match, including tractor-trailer and rail, and is readily available to the individual consumer and the corporate client alike.

- **Clear** – Air transportation is accessible and faster than railroad or trucking.

Effective sentences are complete, containing a subject and a verb. Incomplete sentences—also known as sentence fragments—demonstrate a failure to pay attention to detail. They often invite misunderstanding, which is the opposite of our goal in business communication.

- **Fragments** – Although air transportation is fast. Costs more than trucking.

- **Complete** – Although air transportation is fast, it costs more than trucking.

Effective business writing avoids bureaucratic language and phrase that are the hallmark of decoration. Decoration is a reflection of ritual, and ritual has its role. If you are the governor of a state, and want to make a resolution declaring today as HIV/AIDS Awareness Day, you are allowed to start the document with "Whereas" because of its ritual importance. Similarly, if you are writing

a legal document, tradition calls for certain standard phrases such as "know all men by these presents." However, in standard business writing, it is best to refrain from using bureaucratic phrases and ritualistic words that decorate and distract the reader from your clear, essential meaning. If the customer, client, or supplier does not understand the message the first time, each follow-up attempt to clarify the meaning through interaction is a cost. Table 4 "Bureaucratic Phrases and Standard Alternatives" presents a few examples of common bureaucratic phrases and standard English alternatives.

Table 4: Bureaucratic Phrases and Standard Alternatives

Bureaucratic Phrase	Standard English Alternatives
At the present time	Now, today
Concerning the matter of	Regarding, about
Despite the fact that	Although, while, even though
Due to the fact that	Because, since, as
Implement an investigation of	Find out, investigate
Inasmuch as	Because, since, as
It has been suggested	[Name of person or organization] has suggested, said, or stated
It is believed that	[Name of person or organization] believes, thinks, or says that
It is the opinion of the author	I believe, I think, in my opinion
Until such time as	Until, when
With the exception of	Except, apart from

In oral communication, repetition can be an effective strategy to reinforce a message, but in written communication it adds needless length to a document and impairs clarity.

- **Redundant** – In this day and age air transportation by air carrier is the clear winner over alternative modes of conveyance for speed and meeting tight deadlines.

- **Clear** – Today air transportation is faster than other methods.

When a writer states that something is a "true fact," a group achieved a "consensus of opinion," or that the "final outcome" was declared, the word choices reflect an unnecessary redundancy. A fact, consensus, or outcome need not be qualified with words that state similar concepts. If it is fact, it is true. A consensus, by definition, is formed in a group from diverse opinions. An outcome is the final result, so adding the word "final" repeats the fact unnecessarily.

In business writing we seek clear and concise writing that speaks for itself with little or no misinterpretation. The more complex a sentence becomes, the easier it is to lose track of its meaning. When we consider that it may read by someone for whom English is a second language, the complex sentence becomes even more problematic. If we consider its translation, we add another layer of complexity that can lead to miscommunication. Finally, effective sentences follow the KISS formula for success: Keep It Simple—Simplify!

TRANSITIONS

If you were going to build a house, you would need a strong foundation. Could you put the beams to hold your roof in place without anything to keep them in place? Of course not; they would fall down right away. In the same way, the columns or beams are like the main ideas of your document. They need to have connections to each other so that they become interdependent and stay where you want them so that your house, or your writing, doesn't come crashing down.

Transitions involve words or visual devices that help the audience follow the author's ideas, connect the main points to each other, and see the relationships you've created in the information you are presenting. They are often described as bridges between ideas, thought or concepts, providing some sense of where you've been and where you are going with your document. Transitions guide the audience in the progression from one significant idea, concept, or point to the next. They can also show the relationships between the main point and the support you are using to illustrate your point, provide examples for it, or refer to outside sources. Table 5 "Types of Transitions in Writing" is a summary of fourteen different types of transitions. Consider them as you contemplate how to bring together your information and make notes on your outline.

Table 5: Types of Transitions in Writing

	Type	Definition	Examples
1.	Internal Previews	An **internal preview** is a brief statement referring to a point you are going to make. It can forecast or foreshadow a main point in your document.	If we look ahead to, next we'll examine, now we can focus our attention on, first we'll look at, then we'll examine
2.	Signposts	A **signpost** alerts the audience you are moving from one topic to the next. Signposts or signal words draw attention to themselves and focus the audience's attention.	Stop and consider, we can now address, turning from/to, another, this reminds me of, I would like to emphasize
3.	Internal Summaries	An **internal summary** briefly covers information or alludes to information introduced previously. It can remind an audience of a previous point and reinforce information covered in your document.	As I have said, as we have seen, as mentioned earlier, in any event, in conclusion, in other words, in short, on the whole, therefore, to summarize, as a result, as has been noted previously,
4.	Sequence	A **sequence transition** outlines a hierarchical order or series of steps in your document. It can illustrate order or steps in a logical process.	First...second...third, furthermore, next, last, still, also, and then, besides, finally
5.	Time	A **time transition** focuses on the chronological aspects of your order. Particularly useful in an article utilizing a story, this transition can illustrate for the audience progression of time.	Before, earlier, immediately, in the meantime, in the past, lately, later, meanwhile, now, presently, shortly, simultaneously, since, so far, soon as long as, as soon as, at last, at length, at that time, then, until, afterward

6.	Addition	An **addition or additive transition** contributes to a previous point. This transition can build on a previous point and extend the discussion.	Additionally, not to mention, in addition to, furthermore, either, neither, besides, on, in fact, as a matter of fact, actually, not only, but also, as well as
7.	Similarity	A **transition by similarity** draws a parallel between two ideas, concepts or examples. It can indicate a common area between points for the audience.	In the same way, by the same token, equally, similarly, just as we have seen, in the same vein
8.	Comparison	A **transition by comparison** draws a distinction between two ideas, concepts or examples. It can indicate a common or divergent area between points for the audience.	Like, in relation to, bigger than, the fastest, larger than, than any other, is bigger than, both, either...or, likewise
9.	Contrast	A **transition by contrast** draws a distinction of difference, opposition, or irregularity between two ideas, concepts or examples. This transition can indicate a key distinction between points for the audience.	But, neither...nor, however on the other hand, although, despite, even though, in contrast, in spite of, on the contrary conversely, unlike, while instead, nevertheless, nonetheless, regardless, still, though, yet, although
10.	Cause and Effect, Result	A **transition by cause and effect or result** illustrates a relationship between two ideas, concepts or examples and may focus on the outcome or result. It can illustrate a relationship between points for the audience.	As a result, because, consequently, for this purpose, accordingly, so, then, therefore, thereupon, thus, to this end, for this reason, as a result, because , therefore, consequently, as a consequence, and the outcome was

11.	Examples	A **transition by example** illustrates a connection between a point and an example or examples. You may find visual aids work well with this type of transition.	In fact, as we can see, after all, even, for example, for instance, of course, specifically, such as, in the following example, to illustrate my point
12.	Place	A **place transition** refers to a location, often in a spatially organized essay, of one point of emphasis to another. Again, visual aids work well when discussing physical location with the reading audience.	opposite to, there, to the left, to the right, above, adjacent to, elsewhere, far, farther on, below, beyond, closer to, here, near, nearby, next to
13.	Clarification	A **clarification transition** restates or further develops a main idea or point. It can also serve as a signal to a key point.	To clarify, that is, I mean, in other words, to put it another way that is to say, to rephrase it, in order to explain, this means
14.	Concession	A **concession transition** indicates knowledge of contrary information. It can address a perception the audience may hold and allow for clarification.	We can see that while, although it is true that, granted that, while it may appear that, naturally, of course, I can see that, I admit that while

KEY TAKEAWAY

Organization is the key to clear writing. Organize your document using key elements, an organizing principle, and an outline. Organize your paragraphs and sentences so that your audience can understand them, and use transitions to move from one point to the next.

EXERCISES

1. What functions does organization serve in a document? Can they be positive or negative? Explain and discuss with a classmate.

2. Create an outline from a sample article or document. Do you notice an organizational pattern? Explain and discuss with a classmate.

3. Find an example of a poor sentence or a spelling or grammar error that was published online or in print and share your finding with the class.

4. Which of the following sentences are good examples of correct and clear business English? For sentences needing improvement, describe what is wrong and write a sentence that corrects the problem. Discuss your answers with your classmates.

   - Marlys has been chosen to receive a promotion next month.

   - Because her work is exemplary.

   - At such time as it becomes feasible, it is the intention of our department to facilitate a lunch meeting to congratulate Marlys

   - As a result of budget allocation analysis and examination of our financial condition, it is indicated that salary compensation for Marlys can be increased to a limited degree.

   - When will Marlys's promotion be official?

   - I am so envious!

   - Among those receiving promotions, Marlys, Bob, Germaine, Terry, and Akiko.

   - The president asked all those receiving promotions come to the meeting.

   - Please attend a meeting for all employees who will be promoted next month.

   - Marlys intends to use her new position to mentor employees joining the firm, which will encourage commitment and good work habits.

LICENSES AND ATTRIBUTIONS

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2.3 HOW DO YOU DISPLAY INFORMATION?

THE VALUE OF VISUAL INSTRUCTIONS

Visual instructions may or may not include text. Generally, it is good to have both because there are different learning styles. However, it can often vary depending on the intended use of the instructions. Visual instructions serve to clarify a concept that is difficult to explain using only words. Graphics may be used to show how something looks, how it should look once the step has been completed, and how something is done or constructed. Visuals can show trends or relationships, add liveliness to the project, or simply organize information. Graphics are useful since almost everyone (including children and a global audience) can understand visual instructions. Graphics are useful in instructions because people can see exactly what they need to complete.

Figure 1: Unlabeled Assembly Diagram
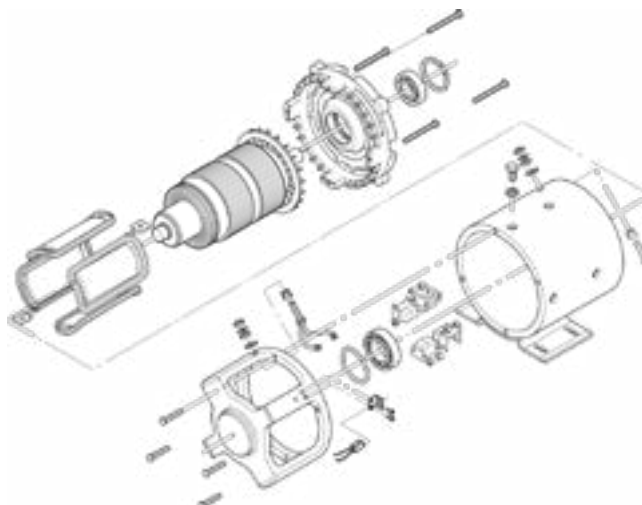
Graphics used in business and marketing do the following:

- Minimize language barriers

- Speed up the learning curves

- Minimize human variability

- Increase instruction use rate and comprehension

- Reduce product returns

- Decrease assembly time- increase customer satisfaction

- Ease technical support

- Visualize and generalize data into understandable trends

- Increase integrity of reports and memos

- Promote professionalism

- Ensure universal understanding

Graphics used in academia do the following:

- Make abstract ideas visible and concrete

- Connect prior knowledge and new concepts

- Provide structure for thinking, writing, discussing, analyzing, planning, and reporting

- Focus thoughts and ideas, leading to understanding and interpretation

- Help students to clarify thoughts, organize and analyze information, integrate new knowledge, and think critically

HISTORY

Graphics have been used for communicating a message or story long before written text. Graphics have a deeper impact across cultures due to their ability to create meaning from the picture not words. Although words may be a part of the Graphic, the images themselves produce the desired response or understanding in the intended audience. Cave paintings and maps are some of the oldest that we know of and anyone that looks upon them can see what the graphic means and what it is for. A map from today would naturally look different from one in the 18th century, but the message would still be the same. The sea routes from England to Africa or the Caribbean would consist of different names, boundaries, and possessions but the audience would still find the same meaning.

Figure 2: Cave Painting

COMMON PROBLEMS WITH VISUAL INSTRUCTIONS

While there are a number of benefits of visual instructions, there are also some drawbacks. When there are no words people may interpret graphics differently. Some graphics can be unclear, and this can confuse the intended audience if the process is very detailed and requires pieces that look identical. When the pictures include a lot of different pieces it is also necessary to zoom in on difficult parts in order to see them better or use exploded diagrams. If you work in a field that employs specialized graphics, use these graphics only when communicating with readers in your field who will understand and expect them (what field can you think of that fits this category?). If you are using the graphics for a wide audience (such as a board game that may be used for young children to senior citizens), make sure that the graphics you choose can be understood by all.

LICENSES AND ATTRIBUTIONS

The Value of Visual Instructions. Provided by: WikiBooks. Located at: http://en.wikibooks.org/wiki/Professional_and_Technical_Writing/Instructions/Visuals#The_Value_of_Visual_Instructions. Project: Professional and Technical Writing. License: *CC BY-SA: Attribution-ShareAlike*

"Diagram" by Pixabay licensed under (CC 1.0)

"Cave paintings, Magura Cave" by MarieBrizard licensed under (CC BY 2.0)

2.4 WHAT IS DATA VISUALIZATION?

Think of the maps you see produced by the television station or website from which you get your weather information. While the meteorologist explains that northern Florida has highs in the 70s, central Florida has highs in the 80s, and southern Florida has highs in the 90s, that information is accompanied by a map. That map may simply have numbers on it, but it also likely has color added to it, with yellow representing a certain range of temperatures, orange representing a warmer range of temperatures, and red representing even hotter temperatures. These colors provide the audience with an additional way of understanding weather patterns. It's not that we don't understand that the "110" hovering over Brownsville, Texas is extremely hot; the dark red color of that area simply reinforces the idea, making it easy for us to quickly absorb information without having to process the actual posted high temperatures.

Sometimes it is beneficial to add visuals into your technical writing, especially if there are a lot of numbers or other types of data involved. Data visualizations such as graphs, charts, tables, and maps organize and communicate information in a way that is accessible to multiple audiences. Depending on the type of visualization, the visualization can help the user look up specific values or identify patterns hidden within the data.

There are many different types of data visualizations that can be and are used, depending on the purpose of the writer and the needs of the audience. Maps can be used to show not only high and low temperatures but also to identify voting patterns or patterns of income across a country. Records of high and low temperatures for the past ten years, or how much people in different professions make annually, can be presented in tables. Tables can also be used to compare and contrast different products. Sales records may be tracked

using a line graph in order to see the rise and fall of sales throughout a quarter or a year; these same records could be presented in a table if the purpose is to be able to look up how many of a particular type of item was sold in a given month, quarter, or year.

Sometimes, more complex visualizations are necessary in order to identify the patterns hidden within the information. Consider, for instance, some of the patterns that David McCandless identifies in the visualizations he presents in this TED Talks (http://www.ted.com/talks/david_mccandless_the_ beauty_of_data_visualization?language=en) video, or McCandless's visual depiction of 20th Century Death(http://www.informationisbeautiful.net/ visualizations/20th-century-death/), where he breaks down the number of deaths according to categories, such as Humanity, and subcategories, such as War, Drugs, and Air Pollution. By breaking down causes of death in the 20th Century Death chart, McCandless enables readers to visualize the impact that diseases such as Smallpox, Tuberculosis, and Whooping Cough had during the 1900s, and compare them to other causes of death such as Road Traffic and Air crashes.

PURPOSE OF DATA VISUALIZATIONS

According to Stephen Few, the purpose of data visualizations "is to communicate important information effectively" (9). As technical communicators, it is our job to use design in order to help our readers understand what the information says the numbers say (9).

More specifically, the purposes of tables, graphs, and other types of data visualizations are to

- Clearly indicate how values relate to one another

- Represent quantities accurately

- Make it easy to compare quantities

- Make it easy to see ranked order of values

- Make obvious how people should use the information

(Few, "Data Visualization for Human Perception")

An extensive description of every type of data visualization would be beyond the scope of the article; there are entire books written on this topic, and if you want to design in-depth, effective visuals, you should read more of Stephen Few's or Edward Tufte's works. The following are some descriptions of common genres and best practices for some of the types of visualizations you may use in your professional and technical communications classes and real world writing experiences.

TABLES

Tables, "lists of data presented in a system of rows and columns" (Dobrin, et al), are useful if you want the reader to be able to look up specific values. Your professional and technical communications instructor, for instance, likely keeps some form of a gradebook such as depicted in Table 1:

Table 1:

Student ID	Exam 1	Exam 2	Exam 3	Homework
12345	97	75	82	95
23456	79	79	81	90
34567	45	78	83	100
45678	99	98	100	100
56789	25	75	82	70

With a table, the data is organized in clearly defined rows and columns, and the instructor can easily look up the grade that each student received on an individual assignment.

DESIGN TIPS FOR TABLES

You've probably seen a lot of tables in your lifetime, and some have probably been easier to read than others. The following are some guidelines for designing tables effectively:

1. Label each row and column clearly so that it is easy to look up values.

2. Use a legible font, and use that same font throughout the table (Few, Show, 177).

3. Avoid using too much ink. If you include solid lines between all items, the table can become more difficult to read (Few, Show, 160-61). See, for instance, Table 2, with the same information redesigned to have lines between each item. Notice that the table appears to be more cluttered than it did previously, even though it still has the same amount of information; this amount of clutter will increase if the table has more items. If necessary, light fill colors (Few, Show, 163) such as those used in Table 1 can be used to allow the reader to scan across lines more effectively.

Table 2:

Student ID	Exam 1	Exam 2	Exam 3	Homework
12345	97	75	82	95
23456	79	79	81	90
34567	45	78	83	100
45678	99	98	100	100
56789	25	75	82	70

GRAPHS AND CHARTS

Graphs and charts are useful when the patterns within the data tell a story. While the information was relatively easy to understand already, we'll use the information from Table 1 as an example. By transferring the numbers for the students' exam scores into Graph 1, it is easy to identify that Student 12345 did better on Exam 1 than he or she did on Exam 2. Students 34567 and 56789, on the other hand, performed much better on Exams 2 and 3 than they did on Exam 1. Students 23456 and 45678, however, performed at approximately the same standard on each exam that they took. These patterns of scores can tell the instructor several pieces of information: Those students who performed consistently likely studied equal amounts for each test, while those who performed better on Exams 2 and 3 than on Exam 1 probably did not study effectively or were having a bad test day for Exam 1.

Graph 1: Exam Bar Chart Using Contrasting Colors

Exam Grades
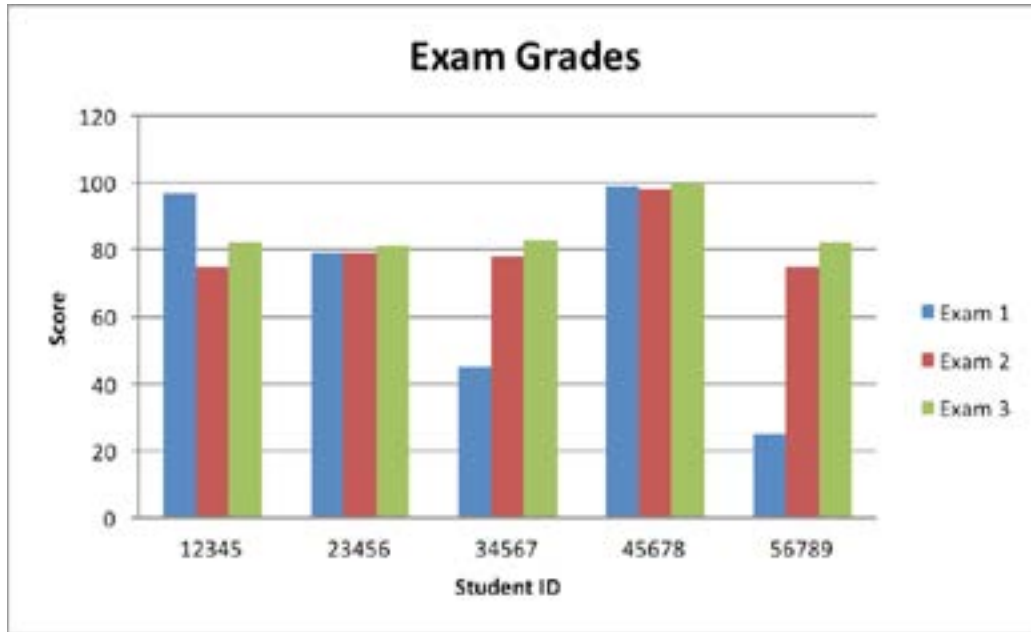
As data visualization designers, you are certainly not limited to bar graphs. On the contrary, there are numerous types of graphs and charts that you can use. While Graph 1 was created with Microsoft Word software, there are many alternative software available, including several free resources online. See the list of Additional Sources at the end of this section for some examples of these resources.

DESIGN TIPS FOR GRAPHS AND CHARTS

1. Label your axes clearly.

2. If an axis contains quantitative information (numbers that have meaning) and shows only positive numbers, then the axis should begin at 0. In some rare cases, it is acceptable to use a different starting point, but if you are starting with a number other than 0, make sure that you mark that clearly. Some designers use varying axes to distort information, which is unethical.

3. Make sure that the spacing is even down columns and across rows. Numerical increments should also be equal down columns and across rows. Using unequal increments is another way to distort information.

GENERAL DESIGN TIPS

When designing tables, graphs, and charts, it is necessary to remember general design tips as well. For starters, let's consider the CRAP (Contrast, Repetition, Alignment, and Proximity) principles of design, which Robin Williams explains in detail in The Non-Designers' Design Book.

CONTRAST

When we write essays in Microsoft Word, the default colors are black letters on a white background. The stark contrast between white and black make the words easier to read. Consider, however, how difficult it would be to read yellow font on a white background or red font on a maroon background. It's more difficult to read those words; we have to pause or squint in order to read them—if we can read them at all.

When we design data visualizations, we sometimes have to use color to show different categories or to make the image more visually appealing; we don't want to be limited to black lettering with a white background. We do, however, need to maintain that level of contrast with the images we design. Look back at Graph 1; notice that the graph uses blue, red, and green for the bars. These colors differ from each other enough that we can see where one bar ends and the next begins without having to pause or squint. If, however, the bars were all various shades of blue, the data would be more difficult to read. Graph 2 demonstrates this lack of contrast. While the graph is still readable because it has relatively few items, Graph 1 is easier to read quickly.

Graph 2: Exam Bar Chart With Little Contrast
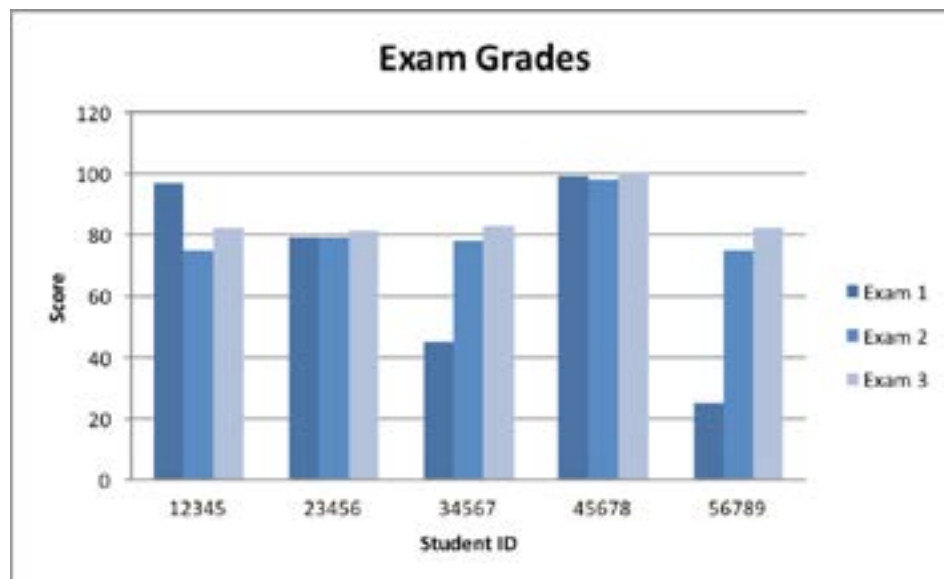
REPETITION

Repeating ideas and colors provides cohesion. Consider the headings and subheadings you see throughout this textbook. Each article heading is written with the same font type, size, and color. This repeated design allows our brains to understand, each time we see that design, that we are looking at a new article within the same textbook.

To apply the principle of repetition to data visualizations, consider Graph 1 once again. Exam 1 is identified with blue ink for each student, Exam 2 is identified with red ink, and Exam 3 is identified with green ink. The repeated color scheme allows us to quickly associate the exam number and compare that exam across the students. The principle of repetition is especially important if you have multiple visualizations throughout your document. If, for instance, you have three tables in a proposal, you want to demonstrate a sense of cohesion among the tables by using the same font, colors, line width, etc.

ALIGNMENT

It is essential to align texts and graphics in a readable manner. Think about the ways in which books and newspapers in the United States are formatted. Generally, text is left aligned or justified; depending on the genre, the beginning of each paragraph may be indented. Because we read from left to right, and our brains are accustomed to seeing text aligned that way, you will rarely will see large amounts of text that are right aligned. For a more in-depth discussion of alignment, look at Clayton Benjamin's article "Formatting Pages."

Alignment is perhaps most essential when dealing with tables, especially if you eliminate or reduce the amount of lines you use. In fact, proper use of alignment can save you the ink of having a lot of dividing lines. Align quantitative numbers to the right, thus allowing the ones, tens, etc. digits to align. If numbers are present in non-quantitative forms (e.g. the Student IDs in Tables 1 and 2), they can be left aligned. Most other information should be left aligned (Few, Show, 171).

PROXIMITY

When two images or pieces of information are placed close to each other, we assume them to be connected in some way. If two images or pieces of information are placed further away from each other, we assume that they are not related or are not closely related. For instance, consider the subheading "Proximity." There is a space between the last Alignment paragraph and the word Proximity while there is not a space between Proximity and this paragraph. Thus, before we even read the content of the paragraphs, we

know that this paragraph belongs with the subheading "Proximity" and not "Alignment," or another section.

When designing tables, charts, and graphs, it is necessary to place related information close together. For instance, labels for parts of a graph (e.g. the Student IDs numbers in Graphs 1 and 2) are placed as close as possible to that particular student's scores.

PROBLEMATIC CHART PRACTICES

One type of chart that is particularly popular is the pie chart. While some use them often because they allow the audience to see a basic part-to-whole relationship, they are also often criticized. Few, for instance, indicates that pie charts are ineffective because "[they] [encode] values as visual attributes . . . that we cannot easily perceive and compare" ("Data Visualization"). In other words, a quick glance at a pie chart informs us of general ratios, but it is often difficult to see the difference between amounts. For instance, if one section represents 20% and another represents 23%, the average human eye cannot discern the difference.

Another issue to be aware of is the use of 3D, which many also consider ineffective because the effect renders the information difficult to read accurately. Few indicates that 3D "cannot be applied effectively to graphs on a flat surface (e.g., a page or computer screen), which relies on illusory cues of light and shadow, occlusion, and size to simulate depth. Even if 3-D position could be used effectively on a flat surface, it is not an effective attribute to use in table and graph design because our perception of depth is weak compared to our perception of height and width" (Show 71).

HOW SHOULD WE REFER TO THE VISUALIZATIONS?

Notice how the tables and graphs were discussed in this article. In order to effectively communicate the information in data visualizations, you need to label the visualizations properly, refer to them in the body of the text, and place them as close as possible to the relevant text. In a sentence or two (or maybe even a paragraph, if necessary) identify the most crucial piece of information you want your audience to get from your visualization. Remember that part of the reason you're including these visualizations is to reach a wider

audience. By pointing out the most relevant information in the text, you can more effectively reach various types of learners.

EXERCISES

1. Type "ineffective charts," "ineffective graphs," "unethical charts," or some version thereof into Google Images. Find two or three differently-designed graphs and charts and discuss why the data visualizations are not effective.

2. Find a textbook, report, or other document that includes some sort of data visualization. What types of information did the author choose to visualize? As a reader, how does the visualization help you to better understand the information presented?

3. Consider those same data visualizations, this time looking at how the writer talks about the visualization. How does the writer introduce the visualization within the text? Where is the visualization placed in relation to its textual reference?

LICENSES AND ATTRIBUTIONS

Dobrin, S. I., Keller, C. J., & Weisser, C. R. (2008). Technical communication in the twenty-first century. Upper Saddle River, NJ: Pearson Prentice Hall. Few, S. (2012).

Show me the numbers: Designing tables and graphs to enlighten. (2nd ed.). Burlingame, CA: Analytics Press.

"Data Visualization for Human Perception" by Stephen Few. In: Soegaard, Mads and Dam, Rikke Friis (eds.). "The Encyclopedia of Human-Computer Interaction, 2nd Ed.". Aarhus, Denmark: The Interaction Design Foundation. Available online at https://www.interaction-design.org/encyclopedia/data_visualization_for_human_perception.html

2.5 HOW DO YOU ETHICALLY PRESENT INFORMATION?

ETHICS IN TECHNICAL WRITING

This section will introduce you to some of the ethical issues that may arise as technical writers research, write, revise, and produce a technical document.

Like other professionals, technical writers come up against ethical issues regularly and must make decisions about how to move forward with a project in the face of ethical dilemmas. Writers may encounter situations in which they must ask the following kinds of questions: What kinds of support material and sources are ethical to use? Are open web sources just as valid as academic sources for certain topics? Can email communications be used without permission? What if the writer discovers that a company falsified data about the effectiveness of its product? Should she reveal this in her report or should she take other courses of action? How much should a writer adapt to an audience without sacrificing his own views?

Ethics principles provide the basis for deciding whether "x" is ethical, but in reality, ethical issues are complicated—for example, imagine working for a large company that employs substantial numbers of people in your town, where relatively few other employment opportunities exist. Imagine that the company disposes of its chemical waste in a way that could endanger people's health. Imagine, further, that the company cannot afford to dispose of this waste more safely and that, if you turn them in, the company will close down, most of the town will be unemployed, and the town's entire economy will collapse. What do you do? Is the risk of future health problems more serious than the certainty of immediately destroying your town? Which choice is really more ethical?

On a smaller scale, if one way of presenting evidence requires some manipulation of data but seems to be the only way of keeping sales strong enough for your company to survive, what should you do? If you take the unethical route, odds are good that few (or no) people will realize you have done so, and you would not be doing anything illegal. If you take the ethical route, and sales plummet, few people will recognize the ethical issue, but most will clearly understand that you caused the sales decline.

ETHICS GENERAL PRINCIPLES

In day-to-day life, most people have a sort of sliding scale on what constitutes ethical behavior: they would not tell a direct lie on trivial matters if doing so would hurt someone's feelings. For example, you might tell your best friend her new haircut looks attractive when in fact you believe that it does not. This lie, though minor, preserves your friend's feelings and does no harm to her or anyone else. Some might consider the context before determining how to act. For example, you might not tell a stranger that he was trailing toilet paper but you would tell a friend. In a more serious situation, a person might not choose to die to save a stranger's life, but she might risk dying to save her children's lives.

Ethical behavior, including ethical technical communication, involves not just telling the truth and providing accurate information, but telling the truth and providing information so that a reasonable audience knows the truth. It also means that you act to prevent actual harm, with set criteria for what kinds and degrees of harm are more serious than others (for example, someone's life outweighs financial damage to your company; your company's success outweighs your own irritation). As a guideline, ask yourself what would happen if your action (or non-action) became public. If you would go to prison, lose your friends, lose your job, or even just feel really embarrassed, the action is probably unethical.

PRESENTATION OF INFORMATION AND ETHICS

How a writer presents information in a document can affect a reader's understanding of the relative weight or seriousness of that information. For example, hiding some crucial bit of information in the middle of a long paragraph deep in a long document seriously de-emphasizes the information. On the other hand, putting a minor point in a prominent spot (say the first item in a bulleted list in a report's executive summary) tells your reader that it is crucial.

A classic example of unethical technical writing is the memo report NASA engineers wrote about the problem with O ring seals on the space shuttle Challenger. The unethical feature was that the crucial information about

the O rings (O rings provide a seal) was buried in a middle paragraph, while information approving the launch was in prominent beginning and ending spots. Presumably, the engineers were trying to present a full report, including safe components in the Challenger, but the memo's audience—non-technical managers—mistakenly believed the O ring problem to be inconsequential, even if it happened. The position of information in this document did not help them understand that the problem could be fatal. Possibly the engineers were just poor writers; possibly they did not consider their audience; or possibly they did not want to look bad and therefore emphasized all the things that were right with the Challenger. (Incidentally, the O rings had worked fine for several launches.)

Ethical writing, then, involves being ethical, of course, but also presenting information so that your target audience will understand the relative importance of information and understand whether some technical fact is a good thing or a bad thing.

TYPICAL ETHICS ISSUES IN TECHNICAL WRITING

There are a few issues that may come up when researching a topic for the business or technical world that a writer must consider. Let's look at a few.

RESEARCH THAT DOES NOT SUPPORT THE PROJECT IDEA

In a technical report that contains research, a writer might discover conflicting data which does not support the project goal. For example, your small company continues to have problems with employee morale. Research shows bringing in an outside expert, someone who is unfamiliar with the company and the stakeholders, has the potential to impact the greatest change. You discover, however, that to bring in such an expert is cost prohibitive. You struggle with whether to leave this information out of your report, thereby encouraging your employer to pursue and action that is really not feasible.

SUPPRESSING RELEVANT INFORMATION

Imagine you are researching a report for a parents' group that wants to change the policy in the local school district requiring all students to be vaccinated. You collect a handful of sources that support the group's goal, but then you discover medical evidence that indicates vaccines do more good than potential harm in society. Since you are employed by this parents' group, should you leave out the medical evidence, or do you have a responsibility to include all research, even some that might sabotage the group goal.

PRESENTING VISUAL INFORMATION ETHICALLY

Visuals can be useful for communicating data and information efficiently for a reader. They provide data in a concentrated form, often illustrating key facts, statistics or information from the text of the report. When writers present information visually, however, they have to be careful not to misrepresent or misreport the complete picture.

The visual below shows two perspectives of information in a pie chart. The data in each is identical but the pie chart on the left presents information in a misleading way (see Graph 3). What do you notice, however, about how that information is conveyed to the reader?

Graph 3: Misleading and regular pie charts
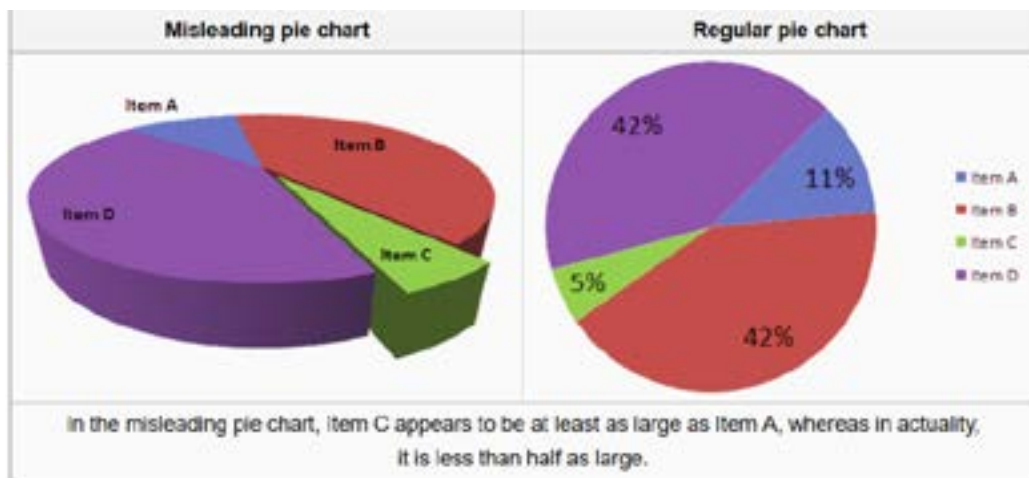
Imagine that these pie charts represented donations received by four candidates for city council. The candidate represented by the green slice labeled "Item C," might think that she had received more donations than the candidate represented in the blue "Item A" slice. In fact, if we look at the same data in a differently oriented chart, we can see that Item C represents less than half of the donations than those for Item A. Thus, a simple change in perspective can change the impact of an image.

Similarly, take a look at the bar graphs in Graph 4 below. What do you notice about their presentation?

Graph 4: Misleading and regular bar graphs
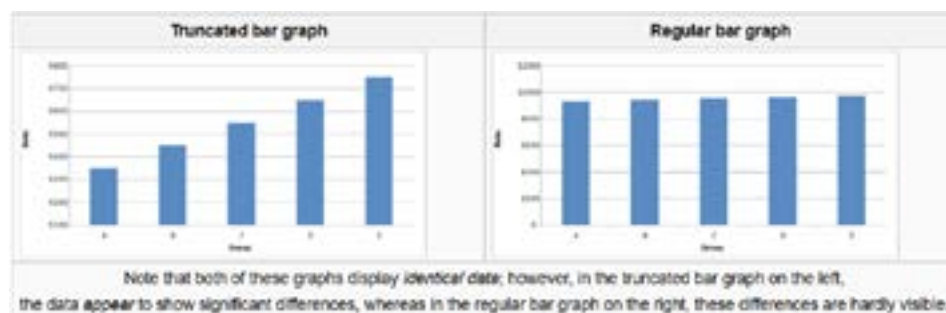
If the bar graph above were to represent sales figures for a company, the representation on the left would look like good news: dramatically increased sales over a five-year period. However, a closer look at the numbers shows that the graph shows only a narrow range of numbers in a limited perspective (9100 to 9800). The bar graph on the right, on the other hand, shows the complete picture by presenting numbers from 0-1200 on the vertical axis, and we see that the sales figures, have in fact been relatively stable for the past five years.

Presenting data in graphical form can be especially challenging. Keep in mind the importance of providing appropriate context and perspective as you prepare your graphics.

LIMITED SOURCE INFORMATION IN RESEARCH

Thorough research requires that a writer integrate information from a variety of reliable sources. These sources should demonstrate that the writer has examined the topic from as many angles as possible. This includes scholarly and professional research, not just from a single database or journal, for instance, but from a variety. Using a variety of sources helps the writer avoid potential bias that can occur from relying on only a few experts. If you were writing a report on the real estate market in Central Oregon, you would not collect data from only one broker's office. While this office might have access to broader data on the real estate market, as a writer you run the risk of looking biased if you only chose materials from this one source. Collecting information from multiple brokers would demonstrate thorough and unbiased research.

A FEW ADDITIONAL CONCERNS

You might notice that most of these ethics violations could easily happen accidentally. Directly lying is unlikely to be accidental, but even in that case, the writer could persuade her/himself that the lie achieved some "greater good" and was therefore necessary.

Even more common is an ethics violation resulting from the person who is designing the information seeing it as evidence for whatever s/he understands as true and honestly not recognizing the bias in how s/he has presented that information.

Most ethics violations in technical writing are (probably) unintentional, but they are still ethics violations. That means a technical writer must consciously identify his/her biases and check to see if a bias has influenced any presentation: whether in charts and graphs, or in discussions of the evidence, or in source use (or, of course, in putting the crucial O ring information where the launch decision makers would realize it was important).

For example, scholarly research is theoretically intended to find evidence either that the new researcher's ideas are valid (and important) or evidence that those ideas are partial, trivial, or simply wrong. In practice, though, most folks are primarily looking for support: "Hey, I have this great new idea that will solve world hunger, cure cancer, and make mascara really waterproof. Now I just need some evidence to prove I am right!"

In fact, if you can easily find 94 high-quality sources that confirm you are correct, you might want to consider whether your idea is worth developing. Often in technical writing, the underlying principle is already well-documented (maybe even common knowledge for your audience) and the point should be to use that underlying principle to propose a specific application.

Using a large section of your report to prove an already-established principle implies that you are saying something new about the principle—which is not true. A brief mention ("Research conducted at major research universities over the last ten years (see literature review, Smith and Tang, 2010) establishes that...") accurately reflects the status of the principle, then you would go on to apply that principle to your specific task or proposal.

ETHICS AND DOCUMENTING SOURCES

Documenting your sources includes showing exactly what you borrowed, both where you used it and in a Works Cited, Works, or References (the different terms reflect different documentation systems, not just random preference) list at the end.

Including an item only in the source list at the end suggests you have used the source in the report, but if you have not cited this source in the text as well, you could be seen as misleading the reader. Either you are saying it is a source when in fact you did not really use anything from it, or you have simply failed to clarify in the text what are your ideas and what comes from other sources.

Documenting source use in such a way as to either mislead your reader about the source or make identifying the source difficult is also unethical—that would include using just a URL or using an article title without identifying the journal in which it appears (in the Works Cited/References; you would not likely identify the journal name in the report's body). Unethical source use also includes falsifying the nature of the source, such as omitting the number of pages in the Works Cited entry to make a brief note seem to be a full article.

Unethical source use includes suppressing information about how you have used a source, such as not making clear that graphical information in your report was already a graph in your source, as opposed to a graph you created on the basis of information in the source.

Note that many problems in documenting sources occur because the writer is missing the point of source use. Therefore, you must do the following:

- Clearly distinguish between your ideas and borrowed material

- Use borrowed material primarily as evidence for your own, directly stated ideas

If you blend source material together with your ideas (including as "your ideas" your analysis or application of borrowed materials), you will indeed find that showing exactly what is borrowed versus what is yours is impossible. That is because you cannot ethically blend your ideas together with source material. Any time you find you cannot apply documentation principles, consider whether you are using the source(s) unethically. Students often argue that they cannot separate their ideas from borrowed ideas because they would then have to document the whole paper—if that is true, the paper is most certainly not making "fair use" of the sources.

ETHICS, PLAGIARISM, AND RELIABLE SOURCES

Unlike personal or academic writing, technical and professional writing can be used to evaluate your job performance and can have implications that a writer may or may not have considered. Whether you are writing for colleagues within your workplace or outside vendors or customers, you will want to build a solid, well-earned favorable reputation for yourself with your writing. Your goal is to maintain and enhance your credibility, and that of your organization, at all times.

Credibility can be established through many means: using appropriate professional language, citing highly respected sources, providing reliable evidence, and using sound logic. Make sure as you start your research that you always question the credibility of the information you find. Are the sources popular or scholarly? Are they peer reviewed by experts in the field? Are the methods and arguments used based on solid reasoning and sound evidence? Is the author identifiable and does s/he have appropriate credentials? Be cautious about using sources that are not reviewed by peers or editor, or in which the information seems misleading, biased, or even false. Be a wise information consumer in your own reading and research in order to build your own reputation as an honest, ethical writer.

Quoting the work of others in your writing is fine, provided that you credit the source fully enough that your readers can find it on their own. If you fail to take careful notes, or the sentence is present in your writing but later fails to get accurate attribution, it can have a negative impact on you and your organization. That is why it is important that when you find an element you would like to incorporate in your document, in the same moment as you copy

and paste or make a note of it in your research file, you need to note the source in a complete enough form to find it again.

Giving credit where credit is due will build your credibility and enhance your document. Moreover, when your writing is authentically yours, your audience will catch your enthusiasm, and you will feel more confident in the material you produce. Just as you have a responsibility in business to be honest in selling your product of service and avoid cheating your customers, so you have a responsibility in business writing to be honest in presenting your idea, and the ideas of others, and to avoid cheating your readers with plagiarized material.

PROFESSIONAL ETHICS

Many organizations and employers have a corporate code of ethics. If you are a technical writer and you join a professional associations such as the Society of Technical Communicators you will need to be aware their codes of ethics, published online. If you are a technical writer researching and writing a report within a specific professional field, you will also need to be aware to that field's codes of ethics. For example, let's say you are writing a report for a group of physical therapists on the latest techniques for rehabilitating knee surgery patients. You should be aware of the code of ethics for physical therapists so that you work within those principles as you research and write your report.

Look for the codes of ethics in your own discipline and begin to read and understand what will be expected of you as a professional in your field.

LICENSES AND ATTRIBUTIONS

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- Thanks to Eleanor Sumpter-Latham, Humanities/Writing Professor at Central Oregon Community College (COCC) for contributing to this chapter.

CHAPTER 3

GENRE TYPES

3.1 WHAT IS A DEFINITION?

EXTENDED DEFINITION - HOW CAN YOU DEFINE IT?

An important writing tool you'll need, particularly if you are writing for non-specialists, is definition—or more specifically, extended definition. An extended definition is one or more paragraphs that attempt to explain a complex term. Some terms may be important in your report, there may be much confusion about them, or they may be difficult to understand that an extended discussion is vital for the success of your report.

When you write reports, you may often discover that you need to explain certain basics before you can discuss the main subject matter. For example:

- In a report on new treatments for sickle cell anemia, you'd need a section defining the disease.

- In a report on the benefits of drip irrigation, you'd need to write an extended definition of drip irrigation, explaining how it works and what equipment is used.

- In a report showing small businesses how to weather economic recessions, an extended definition of the term "economic recession" would be needed first.

WRITING FORMAL SENTENCE DEFINITIONS

One of the first things to do when you write an extended definition is to compose the formal sentence definition of the term you are writing about. Place it toward the beginning of the extended definition. This formal definition establishes the focus for the rest of the discussion. It is "formal" because it uses a certain form. Here are several examples:

Figure 1: Formal Sentence Definitions

Formal sentence definitions: their components are the term being defined, the class it belongs to, and its distinguishing characteristics.

Take particular care when you write the reference to the class to which the term belongs; it sets up a larger frame of reference or context. It gives readers something familiar to associate the term with. The term may belong to a class of tools, diseases, geological processes, electronic components; it may be a term from the field of medicine, computer science, agriculture, reprographics, or finance. Avoid vague references to the class the term belongs to; for example, instead of calling a concussion an "injury" or botulism a "medical problem," call them something more specific like "a serious head injury" and "a severe form of food poisoning," respectively.

Similarly, provide plenty of specific detail in the characteristics component of the formal sentence definition. Readers need these details to begin forming their own understanding the term you are defining.

Be aware, however, that your formal sentence definition will likely contain additional potentially unfamiliar terms. Somewhere in your extended definition, you'll need to explain them as well, possibly by using short definitions (explained later in this section). A formal sentence definition used in an extended definition is below:

Figure 2: Extended Definition 1

Formal sentence definition begins this extended definition.

Supplementary definition used within this extended definition.

Stress is a measure of the internal reaction between elementary particles of a material in resisting separation, compacting, or sliding that tend to be induced by external forces. Total internal resisting forces result from continuously distributed normal and tangential forces that vary in magnitude and direction and act on elementary areas throughout the material. These forces may be distributed uniformly or nonuniformly. Stresses can be categorized as tensile, compressive, or shearing, according to the straining action. Strain is a measure of deformation such as:

a. linear strain, the length per unit of linear dimensions

b. shear strain, the angular skew in a radians of an element undergoing change of shape by tangential forces

c. volumetric strain, the change of volume per unit of volume. The strains associated with stress are characteristic of the material

CHOOSING THE SOURCES OF DEFINITION

When you write an extended definition, you literally grab at any of the writing resources or tools that will help you explain the term to your readers. This means considering all of the various sources of information that can help define the term adequately (for example, description, process narration, causal discussion, and classification).

The key to writing a good extended definition is to choose the sources of definition to help readers understand the term being defined. Use this checklist to select the kinds of discussion to include in your extended definitions:

Figure 3: Sources of Extended Definitions

Sources of Extended Definition

Description	Does anything related to the term being defined need to be described?
Process narration	Is there some process (natural, social) associated with the term that should be discussed?
Additional definitions	Do unfamiliar terms occurring in the definition also need definition?
Historical background	Is there some history, some key individuals related to term being defined? Would that discussion contribute to he definition of the term?
Cause, causes	Does the reader need to know about causes related to the term being defined?
Effects, results, consequences	Does the reader need to know about effects related to the term being defined?
Problems, solutions	Does the term being defined represent a problem or a solution?
Statistics	Should you discuss numerical data related to the term defined—percentages, amounts. etc.?
Uses, applications	Would it help to discuss uses or applications related to the term?
Similarities, differences, analogies	Is the term similar to or different from something else? Would an analogy help define the term?
Classes, types, categories	Are there categories that the term can be divided into? Does it belong to a certain category?
Examples	Would examples contribute to the definition of the term?
Future developments, implications	Would an understanding of the roots, the etymology, of the word help define it?
Word origins	Should future developments related to the term be discussed? Does it have implications—good, bad, both?
Negatives	Would explaining what the term is *not*, what it does *not* refer to help?
Advantages, disadvantages	Are there advantages and disadvantages related to the term that can be discussed?

Below is an outline of a report that uses extended definition. This view shows how different sources of definition can be used to write an extended definition.

Figure 4: Extended Definition Outline

I. Introduction
II. Alzheimer's Disease: Overview of Current Knowledge
   A. Two Main Types of Alzheimer's Disease
      1. Alzheimer's disease (pre-65)
      2. Senile dementia of the Alzheimer's type (post-65)
   B. Demography of Alzheimer's Disease
      1. Age distribution
      2. Gender distribution
      3. Other demographics
   C. Process and Characteristics of Alzheimer's Disease
      1. Forgetfulness
      2. Speech disorders
      3. Difficulty calculating
      4. Visual disorientation
      5. Abnormal judgment and social behavior
   D. Brain Pathology of Alzheimer's Disease Victims
      1. Reduced brain size
      2. Neurofibrillary tangles
      3. Neuritic plaques
      4. Loss of specific populations of nerve cells
   E. Etiology of Alzheimer's Disease
      1. Aging
      2. Inheritance
      3. Infectious agents and toxins
III. Current Alzheimer's Disease Treatment

Classification: the disease is defined according to its main two types.

Description: demographic statistics are used in this definition.

Process: the stages of the disease are identified along with the effects of the disease at each stage.

Effects: clinical effects of the disease.

Causes: various possible causes of the disease.

Below is another extended definition. This one uses additional definitions, description (demographics), and process.

Figure 5: Extended Defintion II

Formal sentence definition begins this extended definition.

Quick parenthetical definition of a potentially unfamiliar term.

Supplementary definitions used within this extended definition.

Demographics (statistics) used to further define the term.

Process of the disease

(Should "intercurrent" be defined for nonspecialist readers?)

First described in 1907 by Alos Alzheimer, a German physician, Alzheimer's disease is an adult-onset neurological disorder of unknown etiology (cause) manifested by loss of memory, impaired thought processes, and abnormal behavior. When the illness begins before the age of 65, it is termed *Alzheimer's disease*; when onset is after 65, it is referred to as *senile dementia of the Alzheimer's type*.

Approximately 5% of the U.S. population over 65 have severe dementia; an additional 10% have a mild-to-moderate impairment in memory and cognition. Of these demented individuals, approximately 40-50% have Alzheimer's disease, making this disorder the most common cause of dementia in middle and later life.

Affected individuals are, at first, forgetful. As the memory disorder gradually worsens, the individuals, although able to recall occurrences in the distant past, are unable to remember recent events. Subsequently, speech, the ability to calculate, visual orientation, judgment, and social behavior become progressively abnormal. Eventually, the individuals become profoundly demented and frequently die of intercurrent infection.

ADDING SHORT DEFINITIONS

You'll find that in writing an extended definition, you must define other terms as well. Typically, short definitions—a sentence, clause, or phrase in length—will suffice. Notice how many are added to the "after" version in the following.

Figure 6: Adding Short Definitions Before & After

Before Translation

Measles is an acute, highly infectious disease, with cough, fever, and maculopapular rash. It has worldwide endemicity. The infective particle is an RNA virus about 100-150 nm in diameter, measured by ultrafiltration, but the active core is only about 65 nm as measured by inactivation after electron irradiation. Negative staining in the electron microscope shows the virus to have the helical structure of a paramyxovirus with the helix being 18 nm in diameter.

Measles virus will infect monkeys easily and chick embryos with difficulty. In tissue cultures, the virus may produce giant multinucleated cells and nuclear acidophilic inclusion bodies. The virus has not been shown to have the receptor-destroying enyzme associated with other paramyxoviruses. Measles, canine distemper, and bovine rinderspest viruses are antigenetically related.

After Translation

Measles is an acute, highly infectious disease caused by a virus. The illness is characterized by a cough, fever, and maculopapular (raised red) rash. It has worldwide endemicity—that is, people throughout the world are vulnerable to the disease. The infective particle (organism causing the disease) is a virus about 100-150 nm (a nanometer being 10^9 meter) in diameter and contains RNA (ribonucleic acid) as its genetic material rather than DNA (deoxyribonucleic acid). The size of the measles virus as measured by ultrafiltration, in which filters with extremely small pore are used. The active core, or actual genetic material (RNA), is only 65 nm, as measured by electron irradiation which inactivates the core. Negative staining, a shadowing technique used with an electron microscope, shows the virus to have a specific helical structure common to a group of viruses known as paramyxoviruses. The helix, a spiral around a core (similar to a winding staircase) is 18 nm in diameter.

Measles virus will infect monkeys easily and chick embryos with difficulty. In tissue cultures (those involving living cells or tissues from other living organisms), the measles virus may produce giant cells containing many nuclei and acidophilic inclusion bodies (red-stained areas in the nucleus which are a laboratory sign for certain viral infections). The virus has not been shown to have the receptor-destroying enyzme, a protein capable of destroying or inactivating a cell-surface molecule, usually associated with other viruses in the paramyxovirus group. Measles, canine distemper (a flu-like disease affecting dogs), and bovine rinderpest (a virus affecting cows) are antigenetically related—that is, they possess similar antigens (molecules that stimulate production of an antibody on their surfaces).
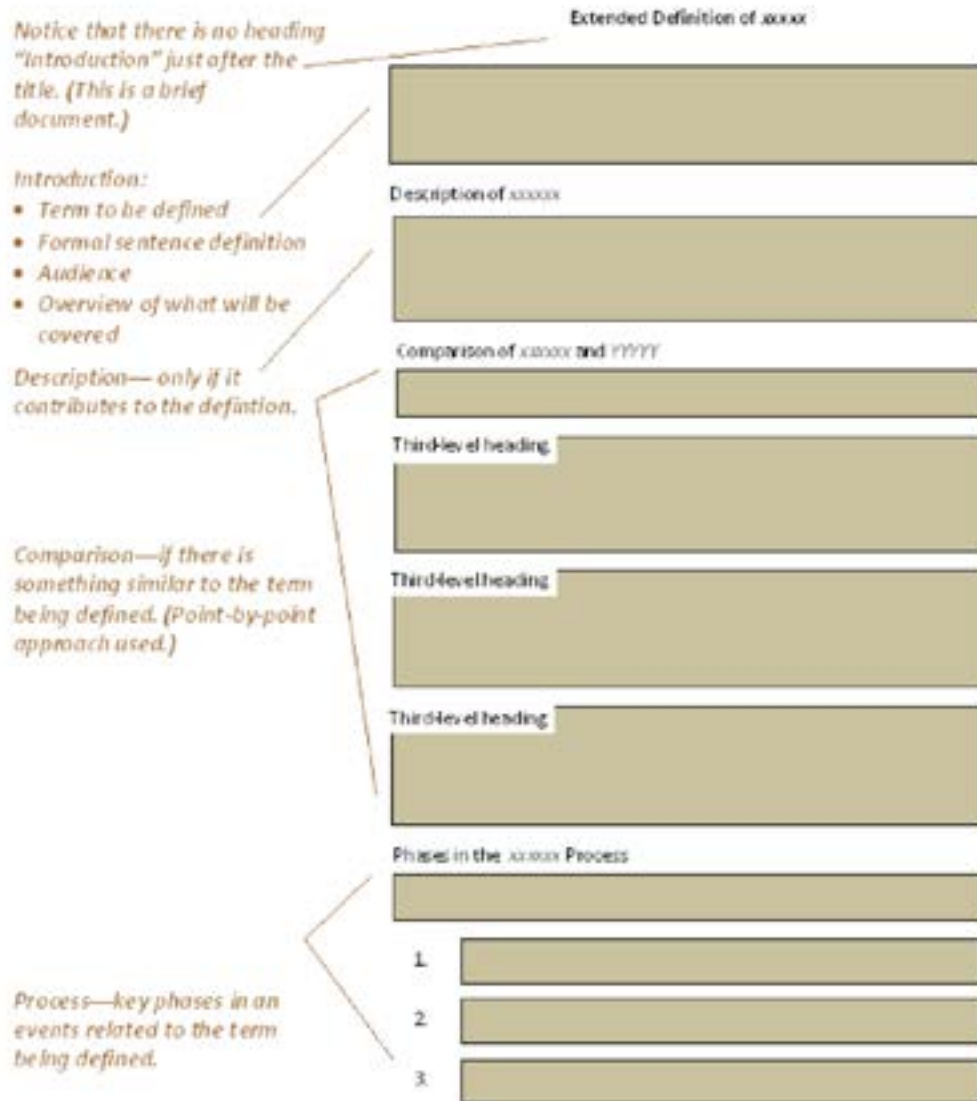
This process of supplying short definitions "on the fly" is critical in good technical writing for non-specialists. Notice how many quick definitions occur just in the first two sentences of the preceding illustration. "Maculopapular" is defined in parentheses as "(raised red)." "Endemicity" is defined by restating the idea in other words: "that is, people throughout the world are capable of contracting measles." And "infective particle" is quickly defined by providing an alternative: "or organism causing the illness." Obviously, the passage is almost tripled in length—but that's the price for thorough explanation and clarity.

FORMAT FOR EXTENDED DEFINITION

Extended definitions don't call out for any special format; just use headings, lists, notices, and graphics as you would in any other technical document.

Below is a schematic view of an extended definition. Remember that this is just a typical or common model for the contents and organization—many others are possible.

Figure 7: Format for Extended Definition

Notice that there is no heading "Introduction" just after the title. (This is a brief document.)

Introduction:
• Term to be defined
• Formal sentence definition
• Audience
• Overview of what will be covered

Description— only if it contributes to the definion.

Comparison—if there is something similar to the term being defined. (Point-by-point approach used.)

Process—key phases in an events related to the term being defined.

Extended Definition of xxxxx

Description of xxxxx

Comparison of xxxxx and YYYY

Third-level heading

Third-level heading

Third-level heading

Phases in the xxxxx Process

1
2
3

COMPLETE EXAMPLE OF AN EXTENDED DEFINITION

Below is an example of an extended definition paper on Sickle Cell Anemia. Note: A technical writing students at the University of Texas at Austin wrote this definition in the 1980s. Technical accuracy cannot be guaranteed.

SICKLE CELL ANEMIA

Sickle cell anemia is a congenital hemolytic anemia that occurs primarily but not exclusively in African-Americans. The condition results from a defective hemoglobin molecule (hemoglobin S) which causes red blood cells (RBCs) to roughen and become sickle-shaped. Such cells impair circulation, resulting in chronic ill health (fatigue, dyspnea on exertion, and swollen joints), periodic crises, long-term complications, and premature death. At present, only symptomatic treatment is available. Half of such patients die by their early 20s; few live to middle age.

CAUSES AND INCIDENCE

Sickle cell anemia results from homozygous inheritance of the hemoglobin S-producing gene, which causes substitution of the amino acid valine for glutamic acid in the B hemoglobin chain. Heterozygous inheritance of this gene results in sickle cell trait, generally an asymptomatic condition. Sickle cell anemia is most common in tropical Africans and in persons of African descent. About 1 in 10 African-Americans carries the abnormal gene. If two such carriers have offspring, there is a 1 in 4 chance that each child will have the disease. Overall, 1 in every 400 to 600 African-American children has sickle cell anemia. This disease also occurs in Puerto Rico, Turkey, India, the Middle East, and the Mediterranean area. Possibly, the defective hemoglobin S-producing gene has persisted because in areas where malaria is endemic, the heterozygous sickle cell trait provides resistance to malaria and is actually beneficial.

Figure 8: Inheritance of Sickle Cell
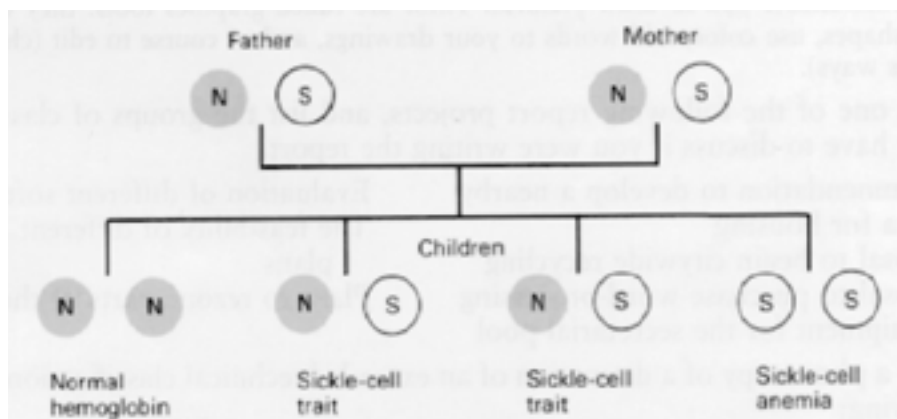
The abnormal hemoglobin S found in such patients' RBCs becomes insoluble whenever hypoxia occurs. As a result, these RBCs become rigid, rough, and elongated, forming a crescent or sickle shape. Such sickling can produce hemolysis (cell destruction). In addition, these altered cells tend to pile up in capillaries and smaller blood vessels, making the blood more viscous. Normal circulation is impaired, causing pain, tissue infarctions, and swelling. Such blockage causes anoxic changes that lead to further sickling and obstruction.

Figure 9: Normal Red Blood Cell vs. Sickle Cells

Normal red blood cells   Abnormal red blood cells (or sickle cells)
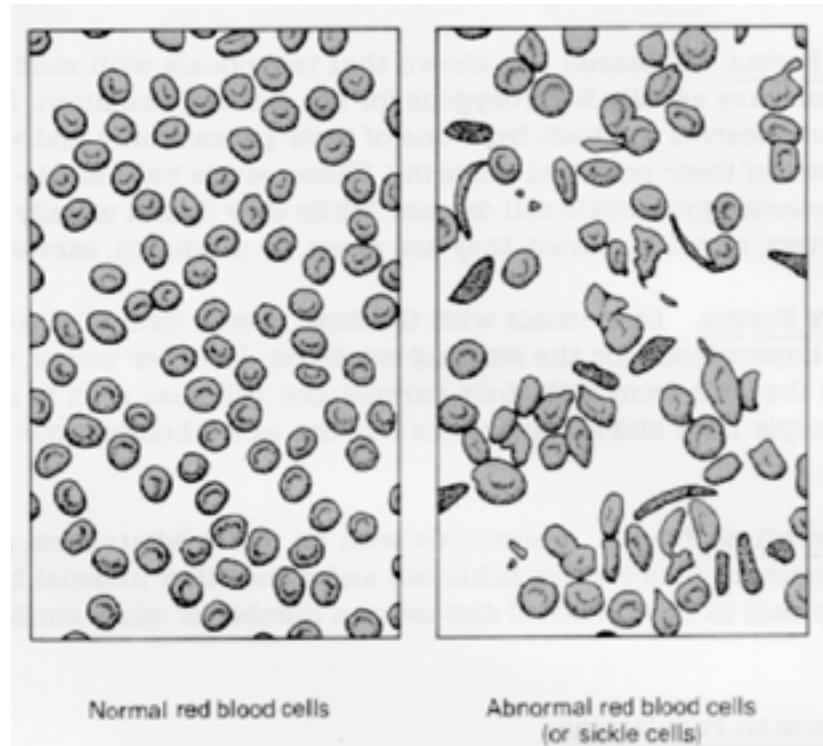
SYMPTOMS AND TYPES OF SICKLE CELL ANEMIA

A number of symptoms are associated with sickle cell anemia, and in particular several types of crises.

Symptoms. Characteristically, sickle cell anemia produces tachycardia, cardiomegaly, systolic and diastolic murmurs, pulmonary infarctions (which may result in cor pulmonale), chronic fatigue, unexplained dyspnea or dyspnea on exertion, hepatomegaly, jaundice, pallor, joint swelling, aching bones, chest pains, ischemic leg ulcers (especially around the ankles), and increased susceptibility to infection. Such symptoms usually don't develop until after 6 months of age, since large amounts of fetal hemoglobin protect infants for the first few months after birth. Low socioeconomic status and related problems, such as poor nutrition and low educational levels, may delay diagnosis and supportive treatment.

Periodic crises. Infection, stress, dehydration, and conditions that provoke hypoxia—strenuous exercise, high altitude, unpressurized aircraft, cold, and vasoconstrictive drugs—may all provoke periodic crisis. Painful crisis. A painful crisis (vaso-occlusive crisis, infarctive crisis), the most common crisis and the hallmark of this disease, usually doesn't appear until age 5 but recurs periodically thereafter. It results from blood vessel obstruction by rigid, tangled sickle cells, which causes tissue anoxia and possibly necrosis. It is characterized by severe abdominal, thoracic, muscular, or bone pain and possibly increased jaundice, dark urine, or a low-grade fever. Autosplenectomy, in which splenic damage and scarring is so extensive that the spleen shrinks and becomes impalpable, occurs in patients with long-term disease. Such autosplenectomy can lead to increased susceptibility to Diplococcus pneumoniae sepsis, which can be fatal without prompt treatment. After the symptoms of crisis subside (in 4 days or several weeks), infection may develop, often indicated by lethargy, sleepiness, fever, or apathy.

Anaplastic crisis. Associated with infection is the anaplastic crisis (megaloblastic crisis) which results from bone marrow depression and is associated with infection, usually viral. It is characterized by pallor, lethargy, sleepiness, dyspnea, possible coma, markedly decreased bone marrow activity, and RBC hemolysis.

Acute sequestration crisis. In infants between 8 months and 2 years old, an acute sequestration crisis may cause sudden massive entrapment of red cells in the spleen and liver. This rare crisis causes lethargy and pallor, and if untreated, can progress hypovolemic shock and death. In fact, it's the most common cause of death in sickle cell children under 1 year.

Hemolytic crisis. Hemolytic crises are quite rare and usually occur in patients who have glucose-6-phosphate dehydrogenase (G-6-PD) deficiency with sickle cell anemia. It probably results from complications of sickle cell anemia, such as infection, rather than from the disorder itself. Hemolytic crisis causes liver congestion and hepatomegaly as a result of degenerative changes. It worsens chronic jaundice although increased jaundice doesn't always point to a hemolytic crisis.

Any of these crises are possible in sickle cell anemia patients with pale lips, tongue, palms, or nail beds; lethargy; listlessness; sleepiness, with difficulty awakening; irritability; severe pain; temperature over 104° F (40° C) or a fever of 100# F (38° C) that persists for 2 days.

Long-term complications. Sickle cell anemia also causes a number of long-term complications. Typically, children with sickle cell anemia are small for the age, and puberty is delayed. (However, fertility is not impaired.) If they reach adulthood, their bodies tend to be spiderlike—narrow shoulders and hips, long extremities, curved spine, barrel chest, and elongated skull. An adult usually has complications stemming from infarction of various organs, such as retinopathy and nephropathy. Premature death usually results from infection, or repeated occlusion of small blood vessels and consequent infarction or necrosis of major organs. For example, cerebral blood vessel occlusion causes cerebrovascular accident.

DIAGNOSIS

A positive family history and typical clinical features suggest sickle cell anemia; a stained blood smear showing sickle cells, and hemoglobin electrophoresis showing hemoglobin S confirm it. Ideally, electrophoresis should be done on umbilical cord blood samples at birth, especially if the parents are known to carry the sickle cell trait. Additional lab studies show low RBC, elevated WBC and platelet count, decreased erythrocyte sedimentation rate (ESR), increased serum iron, decreased RBC survival, and reticulocytosis. Hemoglobin may be low or normal. During early childhood, palpation may reveal splenomegaly, but as the child grows older, the spleen shrinks and splenic function is impaired.

TREATMENT

Treatment is primarily symptomatic and can usually take place at home. If the patient's hemoglobin drops suddenly, as in an anaplastic crisis, or if his condition deteriorates rapidly, hospitalization is needed for transfusion of packed red cells. In a sequestration crisis, treatment may include blood transfusion, oxygen administration, and large amounts of oral or IV fluids. So far, research to find an effective antisickling agent hasn't been successful.

WRITING DEFINITIONS

This page is brought to you by the OWL at Purdue (https://owl.english.purdue.edu/).

SUMMARY:

This handout provides suggestions and examples for writing definitions.

Contributors: Mark Pepper, Dana Lynn Driscoll

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A formal definition is based upon a concise, logical pattern that includes as much information as it can within a minimum amount of space. The primary reason to include definitions in your writing is to avoid misunderstanding with your audience. A formal definition consists of three parts.

1. The term (word or phrase) to be defined

2. The class of object or concept to which the term belongs.

3. The differentiating characteristics that distinguish it from all others of its class

For example:

- Water (term) is a liquid (class) made up of molecules of hydrogen and oxygen in the ratio of 2 to 1 (differentiating characteristics).

- Comic books (term) are sequential and narrative publications (class) consisting of illustrations, captions, dialogue balloons, and often focus on super-powered heroes (differentiating characteristics).con

- Astronomy (term) is a branch of scientific study (class) primarily concerned with celestial objects inside and outside of the earth's atmosphere (differentiating characteristics).

Although these examples should illustrate the manner in which the three parts work together, they are not the most realistic cases. Most readers will already be quite familiar with the concepts of water, comic books, and astronomy. For this reason, it is important to know when and why you should include definitions in your writing.

WHEN TO USE DEFINITIONS

- When your writing contains a term that may be key to audience understanding and that term could likely be unfamiliar to them

  - "Stellar Wobble is a measurable variation of speed wherein a star's velocity is shifted by the gravitational pull of a foreign body."

- When a commonly used word or phrase has layers of subjectivity or evaluation in the way you choose to define it

  - "Throughout this essay, the term classic gaming will refer specifically to playing video games produced for the Atari, the original Nintendo Entertainment System, and any systems in-between."

  - *Note: not everyone may define "classic gaming" within this same time span; therefore, it is important to define your terms*

- When the etymology (origin and history) of a common word might prove interesting or will help expand upon a point

    - "Pagan can be traced back to Roman military slang for an incompetent soldier. In this sense, Christians who consider themselves soldiers of Christ are using the term not only to suggest a person's secular status but also their lack of bravery.'

ADDITIONAL TIPS FOR WRITING DEFINITIONS

- Avoid defining with "X is when" and "X is where" statements. These introductory adverb phrases should be avoided. Define a noun with a noun, a verb with a verb, and so forth.

- Do not define a word by mere repetition or merely restating the word.
  "Rhyming poetry consists of lines that contain end rhymes."
  Better:
  "Rhyming poetry is an artform consisting of lines whose final words consistently contain identical, final stressed vowel sounds."

- Define a word in simple and familiar terms. Your definition of an unfamiliar word should not lead your audience towards looking up more words in order to understand your definition.

- Keep the class portion of your definition small but adequate. It should be large enough to include all members of the term you are defining but no larger. Avoid adding personal details to definitions. Although you may think the story about your Grandfather will perfectly encapsulate the concept of stinginess, your audience may fail to relate. Offering personal definitions may only increase the likeliness of misinterpretation that you are trying to avoid.

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3.2 WHAT ARE THE CONVENTIONS OF E-MAIL?

E-MAIL

E-mail is familiar to most students and workers. It may be used like text, or synchronous chat, and it can be delivered to a cell phone. In business, it has largely replaced print hard copy letters for external (outside the company) correspondence, and in many cases, it has taken the place of memos for internal (within the company) communication. E-mail can be very useful for messages that have slightly more content than a text message, but e-mail is still used for fairly brief messages. Many businesses use automated e-mail to acknowledge communications from the public, or to remind associates that periodic reports or payments are due. You may also be assigned to "populate" a form e-mail in which standard paragraphs are used but you choose from a menu of sentences to make the wording suitable for a particular transaction.

E-mail may be informal in personal contexts, but business communication requires attention to detail, awareness that your e-mail reflects you and your company, and a uses professional tone so that it may be forwarded to any third party if needed. E-mail often serves to exchange information within organizations. Although e-mail may have an informal feel, remember that when used for business it needs to convey professionalism and respect. Never write or send anything that you wouldn't want read in public or in front of your company president.

TIPS FOR EFFECTIVE BUSINESS E-MAIL

As with all writing, professional communications require attention to the specific writing context, and it may surprise you that even elements of form can indicate a writer's strong understanding of audience and purpose. The principles explained here apply to the educational context as well; use them when communicating with your instructors and classroom peers. Below are the components of a strong business email:

- **Open with a proper salutation.** Proper salutations demonstrate respect and avoid mix-ups in case a message is accidentally sent to the wrong recipient. For example, use a salutation like "Dear Ms. X" (external) or "Hi Barry" (internal).

- **Include a clear, brief, and specific subject line.** This helps the recipient understand the essence of the message. For example, "Proposal attached" or "Your question of 10/25."

- **Close with a signature.** Identify yourself by creating a signature block that automatically contains your name and business contact information.

- **Avoid abbreviations.** An e-mail is not a text message, and the audience may not find your wit cause to ROTFLOL (roll on the floor laughing out loud).

- **Be brief.** Omit unnecessary words.

- **Use a good format**. Divide your message into brief paragraphs for ease of reading. A good e-mail should get to the point and conclude in three small paragraphs or less.

- **Reread, revise, and review.** Catch and correct spelling and grammar mistakes before you press "send." It will take more time and effort to undo the problems caused by a hasty, poorly written e-mail than to get it right the first time.

- **Reply promptly.** Watch out for an emotional response—never reply in anger—but make a habit of replying to all e-mail within twenty-four hours, even if only to say that you will provide the requested information in forty-eight or seventy-two hours.

- **Use "Reply All" sparingly.** Do not send your reply to everyone who received the initial e-mail unless your message absolutely needs to be read by the entire group.

- **Avoid using all caps.** Capital letters are used on the Internet to communicate emphatic emotion or yelling and are considered rude.

- **Test links.** If you include a link, test it to make sure it is working.

- **E-mail ahead of time if you are going to attach large files** (audio and visual files are often quite large) to prevent exceeding the recipient's mailbox limit or triggering the spam filter.

- **Give feedback or follow up.** If you don't get a response in twenty-four hours, e-mail or call. Spam filters may have intercepted your message, so your recipient may never have received it.

Figure 10: Table with data

From:	Steve Jobs <sjobs@apple.com>
To:	Human Resources Division <hr@apple.com>
Date:	September 12, 2015
Subject:	Safe Zone Training

Dear Colleagues:

Please consider signing up for the next available Safe Zone workshop offered by the College. As you know, our department is working toward increasing the number of Safe Zone volunteers in our area, and I hope several of you may be available for the next workshop scheduled for Friday, October 9.

For more information on the Safe Zone program, please visit http://www.cocc.edu/multicultural/safe-zone-training/

Please let me know if you will attend.
Steve Jobs
CEO Apple Computing
sjobs@apple.com

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3.3 HOW DO YOU WRITE A MEMO/LETTER?

MEMOS

A memo (or memorandum, meaning "reminder") is normally used for communicating policies, procedures, or related official business within an organization. It is often written from a one-to-all perspective (like mass communication), broadcasting a message to an audience, rather than a one-on-one, interpersonal communication. It may also be used to update a team on activities for a given project, or to inform a specific group within a company of an event, action, or observance.

MEMO PURPOSE

A memo's purpose is often to inform, but it occasionally includes an element of persuasion or a call to action. All organizations have informal and formal communication networks. The unofficial informal communication network within an organization is often called the grapevine, and it is often characterized by rumor, gossip, and innuendo. On the grapevine, one person may hear that someone else is going to be laid off and start passing the news around. Rumors change and transform as they are passed from person to person, and before you know it, the word is that your whole department is shutting down.

One effective way to address informal, unofficial speculation is to spell out clearly for all employees what is going on with a particular issue. If budget cuts are a concern, then it may be wise to send a memo explaining the changes that are imminent. If a company wants employees to take action, management may also issue a memorandum. For example, on February 13, 2009, upper management at the Panasonic Corporation issued a declaration

that all employees should buy at least $1,600 worth of Panasonic products. The company president noted that if everyone supported the company with purchases, it would benefit all (Lewis, 2009).

MEMO FORMAT

A memo has a header that clearly indicates who sent it and who the intended recipients are. Pay particular attention to the title of the individual(s) in this section. Date and subject lines are also present, followed by a message that contains a declaration, a discussion, and a summary.

In a standard writing format, we might expect to see an introduction, a body, and a conclusion. All of these are present in a memo, and each part has a clear purpose. The declaration in the opening uses a declarative sentence to announce the main topic. The discussion elaborates or lists major points associated with the topic, and the conclusion serves as a summary.

Let's examine a sample memo.

Figure 11: Memo Example

To: All Employees
From: Larry Ogawa, President, University of State
Date: February 14, 2009
Subject: Future Expenditure Guidelines

After careful deliberation, I have determined it is necessary to begin the initial steps of a financial stewardship program that carries UState through what appears to be a two-year cycle of a severe state shortfall in revenue and subsequent necessary legislative budget reductions.

Beginning February 9, 2009, the following actions are being implemented for the General Fund, Auxiliary Fund, and Capital Fund in order to address the projected reductions in our state aid for the remainder of this year 2008–09 and for next year 2009–10:

1. Only purchases needed to operate the university should be made so that we can begin saving to reduce the impact of 2009–10 budget reductions.

2. Requests for out-of-state travel will require approval from the Executive Committee to ensure that only necessary institutional travel occurs.

3. Purchases, including in-state travel and budget transfers, will require the appropriate vice president's approval.

Please understand that we are taking these prudent steps to create savings that will allow UState to reduce the impact of projected cuts in expected 2009–10 legislative reductions. Thank you for your cooperation, and please direct any questions to my office.

FIVE TIPS FOR EFFECTIVE BUSINESS MEMOS

1. AUDIENCE ORIENTATION

Always consider the audience and their needs when preparing a memo. For example, an acronym or abbreviation that is known to management may not be known by all the employees of the organization. If the memo is to be posted and distributed within the organization, the goal is clear and concise communication at all levels with no ambiguity.

2. PROFESSIONAL, FORMAL TONE

Memos are often announcements, and the person sending the memo speaks for a part or all of the organization. While the memo may contain a request for feedback, the announcement itself is linear, from the organization to the employees. The memo may have legal standing as it often reflects policies or procedures, and may reference an existing or new policy in the employee manual, for example.

3. SUBJECT EMPHASIS

The subject is normally declared in the subject line and should be clear and concise. If the memo is announcing the observance of a holiday, for example, the specific holiday should be named in the subject line—for example, use "Thanksgiving weekend schedule" rather than "holiday observance."

4. DIRECT FORMAT

Some written business communication allows for a choice between direct and indirect formats, but memorandums are always direct. The purpose is clearly announced.

5. OBJECTIVITY

Memos are a place for just the facts and should have an objective tone without personal bias, preference, or interest on display. Avoid subjectivity.

KEY TAKEAWAY

Memos are brief business documents usually used internally to inform or persuade employees concerning business decisions on policy, procedure, or actions.

EXERCISES

1. Find a memo from your work or business, or borrow one from someone you know. Share it with your classmates, observing confidentiality by blocking out identifying details such as the name of the sender, recipient, and company. Compare and contrast.

2. Write a memo informing your class that an upcoming holiday will be observed. Post and share with classmates.

LETTERS

Letters are brief messages sent to recipients that are often outside the organization. [2] Letters are often printed on letterhead paper, and represent the business or organization in one or two pages. Shorter messages may include e-mails or memos, either hard copy or electronic, while reports tend to be three or more pages in length.

While e-mail and text messages may be used more frequently today, the effective business letter remains a common form of written communication. Letters can serve to introduce you to a potential employer, announce a product or service, or even communicate feelings and emotions. Below, we'll examine the basic outline of a letter and then focus on specific products or writing assignments.

All writing assignments have expectations in terms of language and format. The audience or reader may have their own idea of what constitutes a specific type of letter, and your organization may have its own format and requirements. This section outlines common elements across letters, but attention should be directed to the expectations associated with your particular writing assignment. There are many types of letters, and many adaptations in terms of form and content, but in this chapter, we discuss the fifteen elements of a traditional block-style letter.

Letters may serve to introduce your skills and qualifications to prospective employers, deliver important or specific information, or document an event or decision. Regardless of the type of letter you need to write, letters can contain up to fifteen elements in five areas. While you may not use all the elements in every case or context, they are listed in Table 9.1 "Elements of a Business Letter."

Table 1: Elements of a Business Letter

Content	Guidelines
1. Return Address	The return address is your address where someone could send a reply. If your letter includes a letterhead with this information, either in the header (across the top of the page) or the footer (along the bottom of the page), you do not need to include the address before the date.
2. Date	The date should be placed at the top, it should be right or left justified, and it should be five lines from the top of the page or letterhead logo.
3. Reference	Like a subject line in an e-mail, the reference section is where you indicate what the letter is in reference to, the subject or purpose of the document.
4. Delivery (Optional)	You may want to indicate on the letter itself how it was delivered. This note can make it clear to a third party that the letter was delivered via a specific method, such as certified mail (a legal requirement for some types of documents).
5. Recipient Note (Optional)	The optional recipient note is where you can indicate if the letter is personal or confidential.
6. Salutation	A common salutation may be "Dear Mr. (full name)." But if you are unsure about titles (i.e., Mrs., Ms., Dr.), you may simply write the recipient's name (e.g., "Dear Cameron Rai") followed by a colon. A comma after the salutation is correct for personal letters, but a colon should be used in business. The salutation "To whom it may concern" is appropriate for letters of recommendation or other letters that are intended to be read by any and all individuals. If this is not the case with your letter, but you are unsure of how to address your recipient, make every effort to find out to whom the letter should be specifically addressed. For many, there is no sweeter sound than that of their name, and to spell it incorrectly runs the risk of alienating the reader before your letter has even been read. Avoid the use of impersonal salutations like "Dear Prospective Customer," as the lack of personalization can alienate a future client.

7. Introduction	The introduction is your opening paragraph and may include an attention statement, a reference to the purpose of the document, or an introduction of the person or topic depending on the type of letter. An emphatic opening involves using the most significant or important element of the letter in the introduction. Readers tend to pay attention to openings, and it makes sense to outline the expectations for the reader up front. Just as you would preview your topic in a speech, the clear opening in your introductions establishes context and facilitates comprehension.
8. Body	If you have a list of points, a series of facts, or a number of questions, they belong in the body of your letter. You may choose organizational devices to draw attention, such as a bullet list, or numbered list. Readers may skip over information in the body of your letter, so make sure you emphasize the key points clearly. The introduction is your core content, where you can outline and support several key points. Brevity is important, but so is clear support for main point(s). Specific, meaningful information needs to be clear, concise, and accurate.
9. Conclusion	An emphatic closing mirrors your introduction with the added element of tying the main points together, clearly demonstrating their relationship. The conclusion can serve to remind the reader, but should not introduce new information. A clear summary sentence will strengthen your writing and enhance your effectiveness. If your letter requests or implies action, the conclusion needs to make clear what you expect to happen. It is usually courteous to conclude by thanking the recipient for his or her attention, and to invite them to contact you if you can be of help or if they have questions. This paragraph reiterates the main points and their relationship to each other, reinforcing the main point or purpose.
10. Close	"Sincerely" or "Cordially" are standard business closing statements. ("Love," "Yours Truly," and "BFF" are closing statements suitable for personal correspondence, but not for business.) Closing statements are normally placed one or two lines under the conclusion and include a hanging comma, as in "Sincerely,"
11. Signature	Five lines after the close, you should type your name (required) and, on the line below it, your title (optional).

12. Preparation Line	If the letter was prepared, or word-processed, by someone other than the signatory (you), then inclusion of initials is common, as in MJD or abc.
13. Enclosures/Attachments	Just like an e-mail with an attachment, the letter sometimes has additional documents that are delivered with it. The enclosures/attachments line indicates what the reader can look for in terms of documents included with the letter, such as brochures, reports, or related business documents.
14. Courtesy Copies or "CC"	The abbreviation "CC" once stood for carbon copies but now refers to courtesy copies. Just like a "CC" option in an e-mail, this section indicates the relevant parties that will also receive a copy of the document.
15. Logo/Contact Information	A formal business letter normally includes a logo or contact information for the organization in the header (top of page) or footer (bottom of page).

STRATEGIES FOR EFFECTIVE LETTERS

Remember that a letter has five main areas:

1. The heading, which establishes the sender, often including address and date

2. The introduction, which establishes the purpose

3. The body, which articulates the message

4. The conclusion, which restates the main point and may include a call to action

5. The signature line, which sometimes includes the contact information

Always remember that letters represent you and your company in your absence. In order to communicate effectively and project a positive image, do the following:

- Be clear, concise, specific, and respectful

- Choose words that contribute to your purpose

- Focus each of your paragraphs on one idea

- Form a complete message using each part of the letter

- Proofread so the letter is free of errors

KEY TAKEAWAYS

- Memos are brief business documents usually used internally to inform or persuade employees concerning business decisions on policy, procedure, or actions.

- Letters are brief print messages often used externally to inform or persuade customers, vendors, or the public.

- A letter has fifteen parts, each fulfilling a specific function.

EXERCISES

1. Find a memo from your work or business, or borrow one from someone you know. Share it with your classmates, observing confidentiality by blocking out identifying details such as the name of the sender, recipient, and company. Compare and contrast.

2. Create a draft letter introducing a product or service to a new client. Post and share with classmates.

3. Write a memo informing your class that an upcoming holiday will be observed. Post and share with classmates.

4. Find a business letter (for example, an offer you received from a credit card company or a solicitation for a donation) and share it with your classmates. Look for common elements and points of difference.

5. Now that you have reviewed a sample letter, and learned about the five areas and fifteen basic parts of any business letter, write a business letter that informs a prospective client or customer of a new product or service.

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[1] Lewis, L. (2009, February 13). Panasonic orders staff to buy £1,000 in products. Retrieved from http://business.timesonline.co.uk/tol/business/markets/japan/article5723942.ece

[2] Bovee, C., & Thill, J. (2010). Business communication essentials: a skills-based approach to vital business English (4th ed.). Upper Saddle River, NJ: Prentice Hall.

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3.4 WHAT IS A PROPOSAL?

PROPOSALS

A proposal gets you or your organization approved or hired to complete a project. It is your opportunity to pitch your idea for change (often times an improvement) within an organization. Proposals often demonstrate that a problem exists that needs addressing and address a very specific audience with the authority to move your suggestions forward.

SOME PRELIMINARIES

In a technical writing course, the proposal assignment is an opportunity for you to present an idea to a specific, named audience about an idea you have to improve a certain aspect of that company, organization, center, or other business. Whatever topic you choose, you must be able to conduct thorough scholarly research that you will integrate into your final report.

To begin planning a proposal, remember the basic definition: a proposal is an offer or bid to complete a project for someone. Proposals may contain other elements—technical background, recommendations, results of surveys, information about feasibility, and so on. But what makes a proposal a proposal is that it asks the audience to approve, fund, or grant permission to do the proposed project.

A proposal should contain information that would enable the audience of that proposal to decide whether to approve the project, to approve or hire you to do the work, or both. To write a successful proposal, put yourself in the place of your audience—the recipient of the proposal—and think about what sorts of information that person would need in order to feel confident having you complete the project.

It is easy to confuse proposals with other kinds of documents in technical writing. Imagine that you have a terrific idea for installing some new technology where you work, and you write up a document explaining how it works, showing the benefits, and then urging management to install it. Is that a proposal? All by itself, this would not be a complete proposal. It would be more like a feasibility report, which studies the merits of a project and then recommends for or against it. However, all it would take to make this document a proposal would be to add elements that ask management for approval for you to go ahead with the project. Additionally, for some technical writing classes offered in college, one of those elements may be scholarly research. Check with your instructor to see if this is the case. Certainly, some writers of proposals must sell the projects they propose, but in all cases, proposals must sell the writer (or the writer's organization) as the one to complete the project.

TYPES OF PROPOSALS

Consider the situations in which proposals occur. A company may send out a public announcement requesting proposals for a specific project. This public announcement—called a request for proposals (RFP)—could be issued through websites, emails, social media, newspapers, or trade journals. Firms or individuals interested in the project would then write proposals in which they summarize their qualifications, project schedules and costs, and discuss their approach to the project. The recipient of all these proposals would then evaluate them, select the best candidate, and then work up a contract.

But proposals also come about much less formally. Imagine that you are interested in doing a project at work (for example, investigating the merits of bringing in some new technology to increase productivity). Imagine that you met with your supervisor and tried to convince her of this. She might respond by saying, "Write me a proposal and I'll present it to upper management." This is more like the kind of proposal you will write in a technical writing course.

Most proposals can be divided into several categories:

- **Internal, external**: A proposal to someone within your organization (a business, a government agency, etc.) is an internal proposal. With internal proposals, you may not have to include certain sections (such as qualifications) or as much information in them. An external proposal is one written from one separate, independent organization or individual to another such entity. The typical example is the independent consultant proposing to do a project for another firm. This kind of proposal may be solicited or unsolicited, as explained below.

- **Solicited, unsolicited**: A solicited proposal is one in which the recipient has requested the proposal. Typically, a company will send out requests for proposals (RFPs) through the mail or publish them in some news source. But proposals can be solicited on a very local level: for example, you could be explaining to your boss what a great thing it would be to install a new technology in the office; your boss might get interested and ask you to write up a proposal that offered to do a formal study of the idea. Unsolicited proposals are those in which the recipient has not requested proposals. With unsolicited proposals, you sometimes must convince the recipient that a problem or need exists before you can begin the main part of the proposal.

TYPICAL SCENARIOS FOR A PROPOSAL

Here are some common scenarios in which you would write a proposal:

- A company has a problem or wants to make some sort of improvement. The company sends out a request for proposals; you receive one and respond with a proposal. You offer to come in, investigate, interview, make recommendations—and present it all in the form of a report.

- An organization wants a seminar in your expertise. You write a proposal to give the seminar—included in the package deal is a guide or handbook that the people attending the seminar will receive.

- An agency has just started using a new online data system, but the user's manual is technically complex and difficult to read. You receive a request for proposals from this agency to write a simplified guide or startup guide.

- A nonprofit organization focused on a particular issue wants an consultant to write a handbook or guide for its membership. This document will present information on the issue in a way that the members can understand.

Not all research topics are appropriate for technical writing. Topics that are based on values and beliefs do not fall into the category of technical. Historical and literary topics do not qualify.

If your technical writing course requires that you integrate scholarly research into your final report, choose a topic for which you can readily find such material. While interviews and other first-hand sources are often valuable to a report, one that relies heavily on these sources will not meet the outcomes of this course. Always check with your instructor about any topic ideas you have before starting on your project.

COMMON SECTIONS IN PROPOSALS

The following provides a review of the sections you will commonly find in proposals. Do not assume that each one of them has to be in the actual proposal you write, nor that they have to be in the order they are presented here. Refer to the assignment sheet provided by your instructor and consider other kinds of information unique to your topic that should be included in your particular proposal.

INTRODUCTION

Plan the introduction to your proposal carefully. Make sure it does all of the following things (but not necessarily in this order) that apply to your particular proposal:

- Indicate that the content of the memo is a proposal for a specific project.

- Develop at least one brief motivating statement that will encourage the recipient to read on and to consider approving the project (especially if it is an unsolicited or competitive proposal).

- Give an overview of the contents of the proposal.

BACKGROUND ON THE PROBLEM, OPPORTUNITY, OR SITUATION

Often occurring just after the introduction, the background section discusses what has brought about the need for the project—what problem, what opportunity exists for improving things, what the basic situation is. For example, management of a chain of day care centers may need to ensure that all employees know CPR because of new state mandates requiring it, or an owner of pine timber land in eastern Oregon may want to get the land producing saleable timber without destroying the environment.

While the named audience of the proposal may know the problem very well, writing the background section is useful in demonstrating your particular view of the problem. Also, if the proposal is unsolicited, a background section is almost a requirement—you will probably need to convince the audience that the problem or opportunity exists and that it should be addressed.

BENEFITS AND FEASIBILITY OF THE PROPOSED PROJECT

Most proposals briefly discuss the advantages or benefits of completing the proposed project. This acts as a type of argument in favor of approving the project. Also, some proposals discuss the likelihood of the project's success. In an unsolicited proposal, this section is especially important—you are trying to "sell" the audience on the project.

DESCRIPTION OF THE PROPOSED WORK (RESULTS OF THE PROJECT)

Most proposals must describe the finished product of the proposed project. In a technical writing course, that means describing the written document you propose to write, its audience and purpose; providing an outline; and discussing such things as its length, graphics, binding, and so forth. In the scenario you define, there may be other work such as conducting training seminars or providing an ongoing service. At this early stage, you might not know all that it will take to complete your project, but you should at least have an idea of some of the steps required.

METHOD, PROCEDURE, THEORY

In some proposals, you will need to explain how you will go about completing the proposed work. This acts as an additional persuasive element; it shows the audience you have a sound, thoughtful approach to the project. Also, it serves to demonstrate that you have the knowledge of the field to complete the project.

SCHEDULE

Most proposals contain a section that shows not only the projected completion date but also key milestones for the project. If you are doing a large project spreading over many months, the timeline would also show dates on which you would deliver progress reports. If you cannot cite specific dates, cite amounts of time for each phase of the project.

COSTS, RESOURCES REQUIRED

Most proposals also contain a section detailing the costs of the project, whether internal or external. With external projects, you may need to list your hourly rates, projected hours, costs of equipment and supplies, and so forth, and then calculate the total cost of the complete project. Internal projects, of course, are not free, so you should still list the project costs: hours you will need to complete the project, equipment and supplies you will be using, assistance from other people in the organization, and so on.

CONCLUSIONS

The final paragraph or section of the proposal should bring readers back to a focus on the positive aspects of the project. In the final section, you can urge them to contact you to work out the details of the project, remind them of the benefits of doing the project, and maybe make one last argument for you or your organization as the right choice for the project.

SPECIAL PROJECT-SPECIFIC SECTIONS

Remember that the preceding sections are typical or common in written proposals, not absolute requirements. Always ask yourself what else might your audience need to understand the project, the need for it, the benefits arising from it, your role in it, and your qualifications to do it. What else do they need to see in order to approve the project and to approve you to do it?

SPECIAL ASSIGNMENT REQUIREMENTS

Depending on the writing situation, your proposal may need to include other specialized elements as well. Your supervisor might ask you to include in your proposal any of the following:

Audience: Describe the audience of the final report (which may be different than the audience for the proposal). You may need to discuss for whom the report is designed, their titles and jobs, their technical background, and their ability to understand the report.

Information sources: List information sources; make sure you know that there is adequate information for your topic; list citations for specific books, articles, reference works, other kinds of sources that you think will contribute to your report.

Graphics: List the graphics you think your report will need according to their type and their content. (If you cannot think of any your report would need, you may not have a good topic—do some brainstorming with your instructor.)

Outline: Include an outline of the topics and subtopics you think you will cover in your report.

PROPOSALS AND AUDIENCE

Remember that, in a technical writing course, the proposal assignment serves several purposes: (1) it gives you some experience in writing a proposal; (2) it gets you started planning your term report; (3) it gives your instructor a chance to work with you on your project, to make sure you have a viable topic. For the second and third reasons, you need to include specific elements in your proposal (as noted in your assignment sheet) some of which may not seem appropriate in a real-world proposal.

The proposal is often the beginning of a weeks-long research and writing process that goes through many stages until it gets to the end point: the technical report. In this case, you only submit the proposal once during this process. After that, you may write and submit different types of documents: a progress report, an outline, an annotated bibliography, a graphics draft, a

report draft, and a final report. Be careful to use the term "proposal" only if you are specifically referring to the proposal stage of your project.

Another point to keep in mind relates to the audience for different kinds of documents that may be produced for the same project. Consider the example of a proposal written to a supervisor at a solar power company suggesting the creation of a policy manual for residential solar panel installers. The proposal's audience may be an executive, whose knowledge of the technicalities may be very broad. Let's imagine the executive approves the proposal and requests completion of the manual, which will be produced well after the proposal. The manual's audience is the technicians, who may have more specialized knowledge than the executive. The content and language used for these two different audiences will need to be adjusted to fit the writing situation.

REVISION CHECKLIST FOR PROPOSALS

As you review and revise your proposal, keep the following in mind:

- Use the right format. Check with your instructor to insure you are using the format requested and look at any samples provided.

- Write a clear summary of (or introduction to) your proposal topic.

- Identify exactly what you are proposing to do.

- Ensure that a report—a written document—is somehow involved in the project you are proposing to do if that is what your instructor has assigned.

- Ensure that the sections of your proposal are in a logical, natural order and that you use sub-headers and bullets (and any other formatting styles) correctly.

- Address the proposal to your named audience—not your instructor.

LICENSES AND ATTRIBUTIONS

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3.5 WHAT IS A FEASIBILITY STUDY/REPORT?

PREPARING FEASIBILITY STUDIES

A feasibility report is a testimony that attempts to create some sort of action. Feasibility reports are created to persuade/help the decision makers to choose between available options. Remember that your option is not the only one; the decision makers will probably have many to choose from. A feasibility report also determines whether or not the investigated task can be done with the amount of resources available or how many resources will be necessary in order to complete the task. A feasibility report may be useful in a lot of different situations such as event planning, finances, or even remodeling your home.

WHAT IS A FEASIBILITY STUDY?

A feasibility study is a way to evaluate the practicality and desirability of a project. Before a company invests time and money into a project, they need to know how successful the project will be before investing. Sometimes companies want to understand input costs, the amount of research that will need to be done, or even the marketability of a project. With input prices, it is essential that companies understand, (even before they put time and research into the project), how much it would cost to go through with their product. Companies also like to know how the public/people will react to the change if they put time into research and go through with their change or promotion of a product. Will people be fighting over the new product, or will it fall through? The purpose of feasibility studies is to provide a company information and analysis on whether or not they should pursue this course of action.

Feasibility reports are usually used to sway decision makers towards one direction or the other. Many times there is only one course of action but there needs to be a second course of action.

QUESTIONS TO CONSIDER FOR YOUR REPORT

WHAT TO CONSIDER IN CREATING FEASIBILITY STUDIES/REPORTS?

It remains important to consider alternatives when you are creating a feasibility study. Decision makers in companies want to understand why they have to make a choice, and then why they should choose this certain option. Feasibility reports need to include detailed information on the problem that has presented itself to provide decision makers with a reason to consider further options.

IS YOUR ARGUMENT IMPORTANT AND APPROPRIATE?

When deciding on whether or not your feasibility study is important you must first recognize the target audience or reader. Professional organizations want your argument or study based around needs or aims of the organization and their future. In professional settings, it is believed that those guiding points or criteria should be known by the people judging your study. In other words, make the study reasonable and have it relate to what you are looking at implementing or the change you want to see happen.

Facts can make your argument important. However, decision makers want to know that your sources are reliable. They want to be assured that the information they are receiving is from a credible source in the industry. This source analysis may turn out to be the most important aspect of any feasibility study and report. Due simply to the fact that any information you gather, no matter the presentation, can be ruined if you're lacking information about your sources or in the worst case if your sources are not credible.

WHAT TO CONSIDER ABOUT YOUR ALTERNATIVES?

It is important to understand how your alternatives compare to the criteria you set in place. In most cases your readers will want to understand how your results compared to others. This allows them to make an educated decision based simply around facts and results.

WHAT HAVE YOU FOUND AGAINST YOUR ALTERNATIVES?

Based on experiments and finding results about possible alternatives and how they fare, it is important to draw conclusions about the alternatives. This comparison is not made to bash other options or products, but is made

to set your product or idea apart. You should include general knowledge or conclusions about what each product does well. This remains an important part because once again decision makers need a basis for comparison; they need a reason to select your idea compared to the alternatives and may already be set in place or will be in the near future.

WHAT SHOULD YOU WRITE IN YOUR CONCLUSION?

Include in your conclusion how you're going to go implement your ideas for the company and how it will enrich the company. Explain why the company should choose your course of action. Compare statistics and data and help the readers understand the logical choice and the course of action that would aid in selecting one option over the other. Explain your expertise on the subject matter and help them realize that your idea is the choice they are looking for. Based on your experiences, the reader will most likely take your side if you present the argument efficiently. Your goal is to get the company to select your course of action based on the key points you outline in your feasibility study.

IMPORTANT FEATURES OF A BASIC FEASIBILITY REPORT

Below are the seven elements of a feasibility report:

1. **Introduction** – Persuade the decision maker to even consider any sort of alternative. You need to convince them to even read your report first. Tell them what they will gain personally or as an organization by considering your work.

2. **Criteria/Constraints** – Specifically map out the criteria of what the ideal outcomes are. This criteria outline will allow you to make practical and logical decisions. You can present the criteria in your feasibility report in one of two ways. First, you can separate the criteria into its own section. This organizational strategy is best when you have an extensive report and you need to go in-depth with the explanation. Second, you can incorporate the criteria throughout your report as the criteria become relevant. Whichever strategy you choose, make sure that the criteria is introduced early in the report. It is also very important to map out the constraints of your suggested solutions. This outline will show the audience that you understand and acknowledge the fact that no solution is perfect. This will also make sure that the audience makes the decision in their best interest.

3. **Method** – Present facts that are accurate and relevant. State the reliable sources you used and what method they came from (internet,interview, book, etc.). Without a credible research method or credible sources your document itself will lack credibility.

4. **Overview of Alternative Options** – Underline the key features of each possible option. Make sure they are easy to understand and presented in a friendly layout. Keep in mind that the goal is to allow your audience to make the best decision.

5. **Evaluation** – Evaluate the options using the criteria you created. This section will be the bulk of your report. Add graphs, charts, etc. to show that you have studied your options, and have come up with statistics that back up your reasons as to why your alternative beats the competition.

6. **Conclusions** – State the conclusion you have came up with. How did you evaluate the alternatives? Which alternative best fits your organization?

7. **Recommendations** – Use your experience and knowledge to state which option you think should be adopted.

Note: All seven elements outlined do not need to be included in the feasibility report depending on audience, circumstance, mission, etc. The elements do not need to be in the exact order outlined above. Specifically the conclusion should be mentioned more than just at the end of the report. It should also be summarized at the beginning of the report and in the case the feasibility report is long, it can be mentioned in the middle as well.

EXECUTIVE SUMMARY

An executive summary should be included at the beginning of the report. In 2-3 pages, the main points of the feasibility study are summarized for a quick review by busy administrators and school board members. The executive summary provides the reader with an overview of the feasibility study and will help them see the entire picture before they read the details. Some decision makers may only read the executive summary.

Thus, the executive summary should be concise and include the major findings of the study followed by a recommendation.

INTRODUCTION

The purpose of the introduction of a feasibility report is two-fold:

1. To answer the reader's question: "Why do we need to look into these alternatives and do they matter?" In order to answer this question, it is necessary to identify the problem that your report will help resolve or what your report is aimed at accomplishing.

2. To talk about the other options that you have looked at and analyzed, as well as to explain how you went about researching and analyzing them.

Note: Usually, the introduction to a feasibility report briefly discusses some of the important conclusions and the most feasible options for change. Other elements of a report of this nature, such as the criteria, method, or any other kind of general background, may also be concisely noted and mentioned in this portion of the report.

CRITERIA/CONSTRAINTS

WHAT TO CONSIDER IN YOUR FEASIBILITY STUDY/REPORT.

As you begin formulating what you would like to consider, you should realize that usually criteria works around one or more of the following questions:

WILL YOUR PLAN OR COURSE OF ACTION REALLY DO WHAT IS DESIRED?

This is often seen on the technical side. Ask yourself whether or not your implementation or change really makes that much of a difference. Let's say you are looking to improve an aspect of your company. Will your change really improve the proficiency and speed of what they're trying to do? Or will you find in your study that the change actually slows down production or the efficiency of the company's workers? This is important to predict beforehand because sometimes an improvement in the workplace is not always an improvement in how a company works. But many of these factors you will not notice until after you complete your study. And in the worst case you may not see negative ailments until after the plan is implemented.

WHAT WILL IT TAKE TO IMPLEMENT YOUR COURSE OF ACTION?

Even though your plan of action may seem correct and efficient on paper, it may not be practical towards your line of work. You must take into account the circumstances that arise in every aspect of a professional setting. What you may find is that in one field your plan may be extremely successful, but in another may be a bust. This can also take place from company to company. As you work at different companies along the same field, you will begin to understand what can be successful in one workplace that may not work in another. Sometimes you have to take into account the amount of changes that will need to be implemented for your plan. Do you need to go through extensive changes in operations, or make upgrades to current equipment or materials that are currently in use or in stock? Sometimes the amount of money that needs to be put into a new project may be much more than the actual amount of benefit that would be received from the changes. You must consider your plan as a cost-benefit analysis.

HOW MUCH WILL IT COST?

This question may become the biggest factor in any business decision. In not only business, but any professional field, the benefits must outweigh the costs in any decision. This is even the case when deciding to work on one aspect of a project compared to the other. When forming criteria for a feasibility report, you must understand the costs if all went as planned. Then you might even want to find out what the cost would be if you had minor or major setbacks. It is important to understand the costs because unless the benefits outweigh the costs, a company will most likely not go through with your proposed plan of action. Also it is important to look into the future of the company. Maybe your plan of action will not be beneficial for the first year in existence, but what about the years following? Like any other decision in business, the original fixed cost may be high but the marginal gains may be high. In that case it may be a good decision for the company to make a change if it is beneficial for the future. Think about health care companies. Would it be beneficial for a company to invest in new equipment even though the upright payment is very high?

IS YOUR IDEA/PRODUCT DESIRABLE?

Will people want to overextend themselves for change, or will they reject what you are trying to do? Sometimes a change or solution must be more than just effective and affordable. You must consider the consumers and people that will be changing. Sometimes many feasible courses of action do not succeed simply because they create effects that drive the consumers away. Because of this, the product or plan is not marketable. These undesirable side effects can be as simple as tearing away employee morale. Sometimes even though a plan is promoting and expected to increase productivity, how will the employees react? Many times companies overlook how their employees are going to react to change. But the fact of the matter is that the only way to increase production is to keep employees happy. If they are not pushed to improve the company and their own status then they simply may not find change necessary.

METHOD

This part of your paper demonstrates to the reader that what you discovered through your research actually matters and has reliability. By telling your audience how you came to know what you have found and know now, you are demonstrating to them that your results are trustworthy and that they truly hold significance in meaning. With strong methods for finding out your facts, your readers will then feel comfortable and confident to make the necessary changes.

🏠
HOME

It's all about the source. The question of what sources to use completely varies from study to study. There are several different types of sources that you could use to find your facts; it all just depends on what you are trying to find answers to. Sources can include (but are not limited to) the following:

- Academic journals or reports

- Library research

- Phone calls

- Face-to-face interviews

- Meetings with those who are knowledgeable about the topic or are in your company/organization

- Surveys (Survey Monkey!)

- Usability Testing

- Lab testings

SOURCE ANALYSIS

The length and density of content will vary from each report to the next. You should take into consideration your audience as well as the context and purpose, for which your paper is written. The main goal is to purely get the point across to the readers that what you are reporting has validity by describing how the means of attaining your information are sound and secure. Make sure that your writing is reader-centered and that they would be satisfied. This will ensure that your method is long and descriptive enough.

PLACEMENT

The placement of this section of your report will also depend on the type of report that you are writing. If there are only a couple of different methods used throughout your research, it might be a good idea to fit them into the beginning of your report, writing a paragraph for each technique. If you have several unrelated methods, however, it would be good to place those paragraphs throughout the report, where they would best accompany your analysis or data.

Note: Sometimes, if it is really obvious how you went about your research, then there might not even be a need to talk about your methods. It is key, though, that your readers always have a clear understanding of the way you obtained your facts and that they are worth trusting.

REVISION CHECKLIST

Once your feasibility study is complete, review the following checklist to ensure every topic has been addressed:

INTRODUCTION

Does it tell your readers why you conducted this study?

Does it provide background information the readers will need or want?

Does it identify the action or alternatives you investigated?

Does it persuade readers to use this study as a valid document?

CRITERIA

Does it identify the standards by which the action or alternatives were evaluated?

METHOD

Does it explain the way you obtained the facts and ideas presented in the report?

Does it persuade the readers that this method would produce reliable results?

OVERVIEW OF ALTERNATIVES

Does it present a general description of each alternative?

EVALUATION

Does it evaluate the action or alternative in terms of criteria?

Does it present the facts and evidence that supports each evaluative statement?

CONCLUSIONS

Does it explain the significance from the reader's viewpoint of your facts?

Does it state the conclusion plain and simple?

RECOMMENDATIONS

Does it advise which course of action or alternative you recommend?

Does it present recommendations which stand out?

Does it suggest specific steps your readers may take to act on each of your recommendations?

FRONT MATTER: CONTENTS, LISTS, AND MORE

The first few pages of a report are essential. These elements are often referred to as "Book Elements," as they are commonly found in larger works, they include the cover page, title page, abstract, table of contents, and list of tables and figures.

Important considerations should also be made on how your publication will be used. To increase usability, you should consider how your readers will be using the report, and what they will be looking for, and focus on making this easy to find. Specifics such as the size of the font, font type, formatting, and organization need to be taken into consideration when creating the front matter of your report.

Below are the elements of the front matter of a report:

COVERS

A cover page is a very simple, precise, brief way to introduce your report to the reader. This page should contain the following:

- A large specific title
- Company name
- Name of the author(s)
- Date of the report
- Relevant picture to help reinforce the subject of the report

One goal of the cover page is to be informative and scalable because once it is filed, it will need to be easy to pick out of a stack of other reports. A second goal is to make the report stand out. If the report cover looks bleak and dull, the reader will start reading with a negative outlook. Think of the cover page of a report like what is worn to an interview. The cover page is the first thing that is seen. It will be the foundation for first impressions, for better or worse. One easy way to make the report stand out is to use a theme for the report that your audience can connect to. For example, if a report is written to McDonald's, the cover page will be in yellow and red with the golden arches as a picture. It is important that the reader believes that he or she is the most important aspect of the report.

TITLE PAGE

A title page will be very similar to your front cover as it repeats the information on the cover, but adds more important details. These extra details may include the report number, date, title, names and addresses of authors, specific

contract information, name and address of the supervisor, and name and address of the organization who supported the report.

The title page is an opportunity to provide specific, detailed information about the document and its authors to its intended audience. See Figure 12 for a sample draft of a title page.

Sample Draft

Figure 12: Sample draft

(Document number) 10-1 (Date) March 7, 2010 (Title) The Madden Project

By (Author) John Manning Brett Peterson 1234 Touch Down Lane Miami, Fl 57897 Madden Inc And

(Place to Contact) Madden Inc. No. 54321

Project officer

(Who's in charge) Ari Washington Manager of Exploratory Research 6667 Prime Time Court Mendota Heights, MN 55178

(Who paid for the project) Football Cooperation The Department of Research and Development 1812 Legacy Drive Columbus, OH 99121

———————

EXECUTIVE SUMMARY OR ABSTRACT

Abstracts are an important element in the business world. Abstracts will help a manager learn the main points of your document, and they will help the reader determine if the entire report is relevant to what they are looking for. Charts and graphs that show factual data are helpful visuals that can be implemented into this section of the document.

Major topics should be mentioned in the abstract, but not the main points of each. This will be where most of the keywords of your report are used, and it will be a preview of the information to be covered. Often, summaries are used when representing a report in a database, so illustrating the main topics of your report in this segment can be useful.

The abstract should always be a page or less, especially in informative situations, and typically an abstract should not be more than 15 percent of the total report.

In an abstract, you will do the following:

- Identify the intended audience

- Describe Contents

- Tell the reader how the information is presented

TABLE OF CONTENTS

In any report or analysis, a table of contents is helpful to navigating the report. Some lengthy reports may also include a table of graphs and/or a table of figures.

In addition to the summary, the table of contents will allow the reader to quickly scan the topics you have covered. This will also help if they are looking for something particular. Use of proper headings and sub-headings gives readers a good overview of all the information contained in your document.

Table of contents are usually extremely generic and similar to each other. This is for ease of navigation to the user. Table of contents can be formatted from Microsoft Word.

LISTS OF TABLES AND FIGURES

This is a useful section to include if your images or tables are referred to repeatedly throughout your text. Include Figures and Tables lists when your report is over about 15 pages. This page also allows for easy comparison between images when they are grouped together.

REPORT DESIGN

Technical reports have specifications as do any other kind of project. Specifications for reports involve layout, organization and content, format of headings and lists, the design of the graphics, and so on. The advantage of a required structure and format for reports is that you or anyone else can expect them to be designed in a familiar way—you know what to look for and where to look for it. Reports are usually read in a hurry—readers are in a hurry to get to the information they need, the key facts, the conclusions, and other essentials. A standard report format is like a familiar neighborhood.

When you analyze the design of a technical report, notice how repetitive some sections are. This duplication has to do with how people read reports. They don't read reports straight through: they may start with the executive summary, skip around, and probably not read every page. Your challenge is to design reports so that these readers encounter your key facts and conclusions, no matter how much of the report they read or in what order they read it.

The standard components of the typical technical report are discussed below. The following sections guide you through each of these components, pointing out the key features. As you read and use these guidelines, remember that these are guidelines, not commandments. Different companies, professions, and organizations have their own varied guidelines for reports—you'll need to adapt your practice to those as well the ones presented here.

LETTER OF TRANSMITTAL

The transmittal letter is a cover letter. It is either attached to the outside of the report with a paper clip or is bound within the report. It is a communication from you—the report writer—to the recipient, the person who requested the report and who may even be paying you for your expert consultation. Essentially, it says "Okay, here's the report that we agreed I'd complete by such-and-such a date. Briefly, it contains this and that, but does not cover this or that. Let me know if it meets your needs." The transmittal letter explains the context—the events that brought the report about. It contains information about the report that does not belong in the report.

In the example of the transmittal letter in the following, notice the standard business-letter format. If you write an internal report, use the memorandum format instead; in either case, the contents and organization are the same:

- **First paragraph.** Cites the name of the report, putting it in italics. It also mentions the date of the agreement to write the report.

- **Middle paragraph.** Focuses on the purpose of the report and gives a brief overview of the report's contents.

- **Final paragraph.** Encourages the reader to get in touch if there are questions, comments, or concerns. It closes with a gesture of goodwill, expressing hope that the reader finds the report satisfactory.

As with any other element in a report, you may have to modify the contents of this letter (or memo) for specific situations. For example, you might want to add another paragraph, listing questions you'd like readers to consider as they review the report.

COVERS AND LABELS

If your report is over ten pages, bind it in some way and create a label for the cover.

COVERS

Covers give reports a solid, professional look as well as protection. You can choose from many types of covers. Keep these tips in mind:

- Avoid the clear (or colored) plastic slip cases with the plastic sleeve on the left edge. These are like something out of freshman English; plus they are aggravating to use—readers must struggle to keep them open and hassle with the static electricity they generate.

- Marginally acceptable are the covers for which you punch holes in the pages, load the pages, and bend down the brads. If you use this type, leave an extra half-inch margin on the left edge so that readers don't have to pry the pages apart. Of course, this type of cover prevents pages from lying flat: readers must grab available objects or use various body parts to keep the pages weighted down.

- The best covers are those that allow reports to lie open by themselves (see the illustration in the next section). What a great relief for a report to lie open in your lap or on your desk. This type uses a plastic spiral for the binding and thick, card-stock paper for the covers. Check with your local copy shop for these types of bindings; they are inexpensive and add to the professionalism of your work. See the simulated example of a plastic spiral binding in the following.

- Generally less preferable are loose-leaf notebooks or ring binders. These are too bulky for short reports, and the page holes tend to tear. Of course, the ring binder makes changing pages easy; if that's how your report will be used, then it's a good choice. At the "high end" are the overly fancy covers with their leatherette look and gold-colored trim. Avoid them— keep it plain, simple, and functional.

LABELS

Be sure to devise a label for the cover of your report. It's a step that some report writers forget. Without a label, a report is anonymous; it gets ignored.

The best way to create a label is to use your word-processing software to design one on a standard page with a graphic box around the label information. Print it out, then go to a copy shop and have it photocopied directly onto the report cover.

Not much goes on the label: the report title, your name, your organization's name, a report tracking number, and a date. There are no standard requirements for the label, although your company or organization should have its own requirements. (An example of a report label is shown below in Figure 13.)

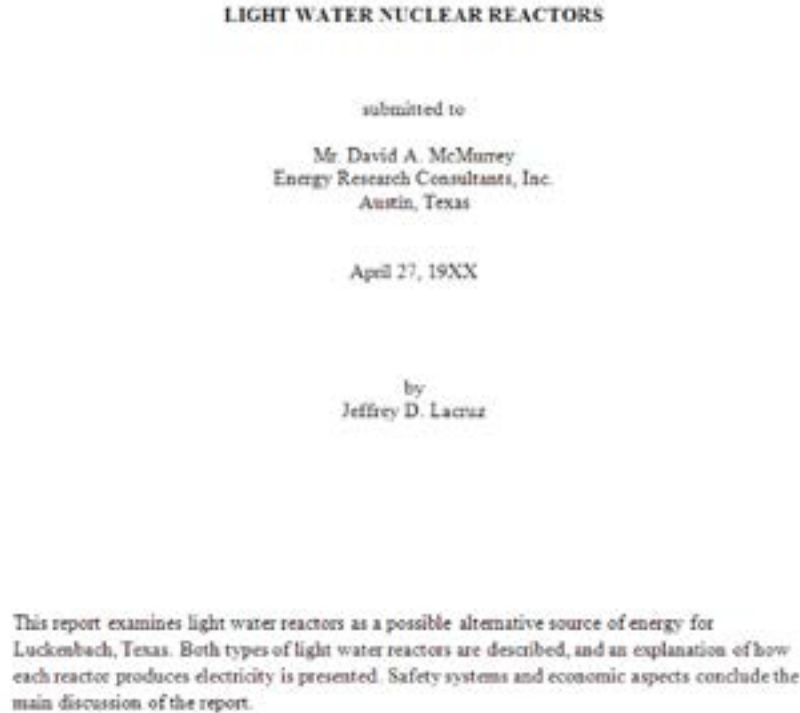*Figure 13: Transmittal letter and report cover (with cover label)*
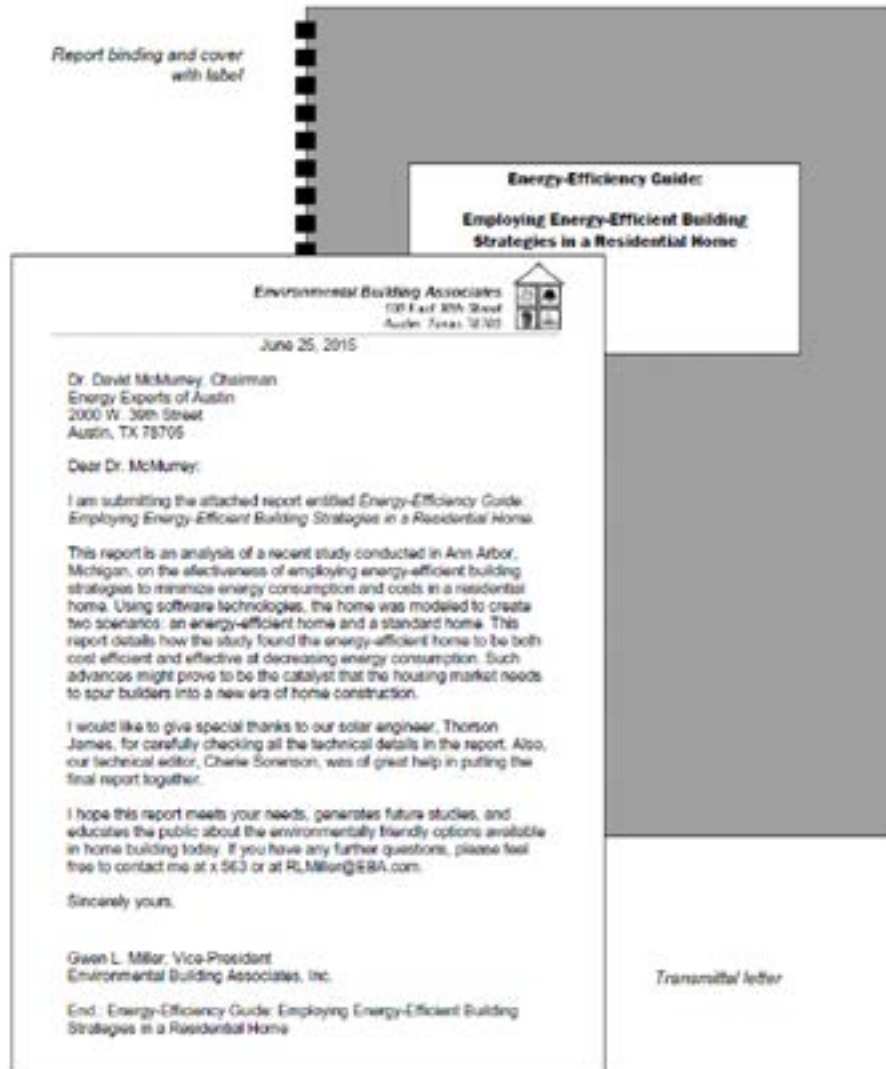
ABSTRACT AND EXECUTIVE SUMMARY

Most technical reports contain at least one abstract, sometimes two, in which case the abstracts play different roles. Abstracts summarize the contents of a report, but the different types do so in different ways:

- **Descriptive abstract.** This type provides an overview of the purpose and contents of the report. In some report designs, the descriptive abstract is placed at the bottom of the title page, as shown in Figure 14.

Figure 14: Descriptive abstract

LIGHT WATER NUCLEAR REACTORS

submitted to

Mr. David A. McMurrey
Energy Research Consultants, Inc.
Austin, Texas

April 27, 19XX

by
Jeffrey D. Lacruz

This report examines light water reactors as a possible alternative source of energy for Luckenbach, Texas. Both types of light water reactors are described, and an explanation of how each reactor produces electricity is presented. Safety systems and economic aspects conclude the main discussion of the report.

- **Executive summary.** Another common type is the executive summary, which also summarizes the key facts and conclusions contained in the report. See the example shown in the following. It's as if you used a yellow highlighter to mark the key sentences in the report and then siphoned them all out onto a separate page and edited them for readability. Typically, executive summaries are one-tenth to one-twentieth the length of reports ten to fifty pages long. For longer reports, ones over fifty pages, the executive summary should not go over two pages. The point of the executive summary is to provide a summary of the report—something that can be read quickly.

If the executive summary, introduction, and transmittal letter strike you as repetitive, remember that readers don't necessarily start at the beginning of a report and read page by page to the end. They skip around: they may scan the table of contents; they usually skim the executive summary for key facts and conclusions. They may read carefully only a section or two from the body of the report, and then skip the rest. For these reasons, reports are designed with some duplication so that readers will be sure to see the important information no matter where they dip into the report.

TABLE OF CONTENTS

You're familiar with tables of contents (TOC) but may never have stopped to look at their design. The TOC shows readers what topics are covered in the report, how those topics are discussed (the subtopics), and on which page numbers those sections and subsections start.

In creating a TOC, you have a number of design decisions:

- **Levels of headings to include.** In longer reports, consider not including only the top two levels of headings. This keeps the TOC from becoming long and unwieldy. The TOC should provide an at-a-glance way of finding information in the report quickly.

- **Indentation, spacing, and capitalization.** Notice in the illustration below that items in each of the three levels of headings are aligned with each other. Although you can't see it in the illustration, page numbers are right-aligned with each other. Notice also the capitalization: main chapters or sections are all caps; first-level headings use initial caps on each main word; lower-level sections use initial caps on the first word only.

- **Vertical spacing.** Notice that the first-level sections have extra space above and below, which increases readability.

One final note: Make sure the words in the TOC are the same as they are in the text. As you write and revise, you might change some of the headings—don't forget to change the TOC accordingly. See the example of a table of contents in Figure 15 below:

Figure 15: Table of contents (which comes first) then the executive summary

This TOC uses decimal-numbering style, which is common in reports. Others use the roman-numeral style. In a technical writing course, ask your instructor if the decimal-numbering style for the table of contents and headings is required. Notice too the cap style for the different TOC levels here.

LIST OF FIGURES AND TABLES

The list of figures has many of the same design considerations as the table of contents. Readers use the list of figures to find the illustrations, diagrams, tables, and charts in your report.

Complications arise when you have both tables and figures. Strictly speaking, figures are illustrations, drawings, photographs, graphs, and charts. Tables are rows and columns of words and numbers; they are not considered figures.

For longer reports that contain dozens of figures and tables each, create separate lists of figures and tables. Put them together on the same page if they fit, as shown in the illustration below. You can combine the two lists under the heading, "List of Figures and Tables," and identify the items as figure or table as is done in the illustration below.

INTRODUCTION

An essential element of any report is its introduction—make sure you are clear on its real purpose and contents. In a technical report, the introduction prepares the reader to read the main body of the report.

See this example of an introduction in Figure 16 below:

Figure 16: List of figures and tables followed by the introduction
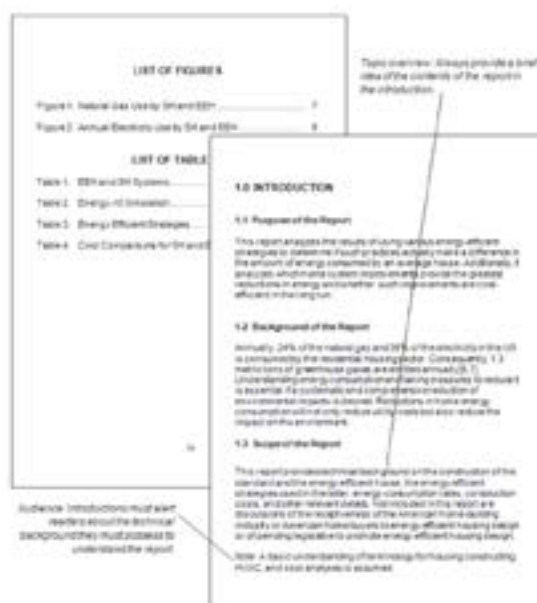
If there are no tables, make it "List of Figures." In a technical writing course, ask your instructor if the decimal-numbering style for headings is required.

BODY OF THE REPORT

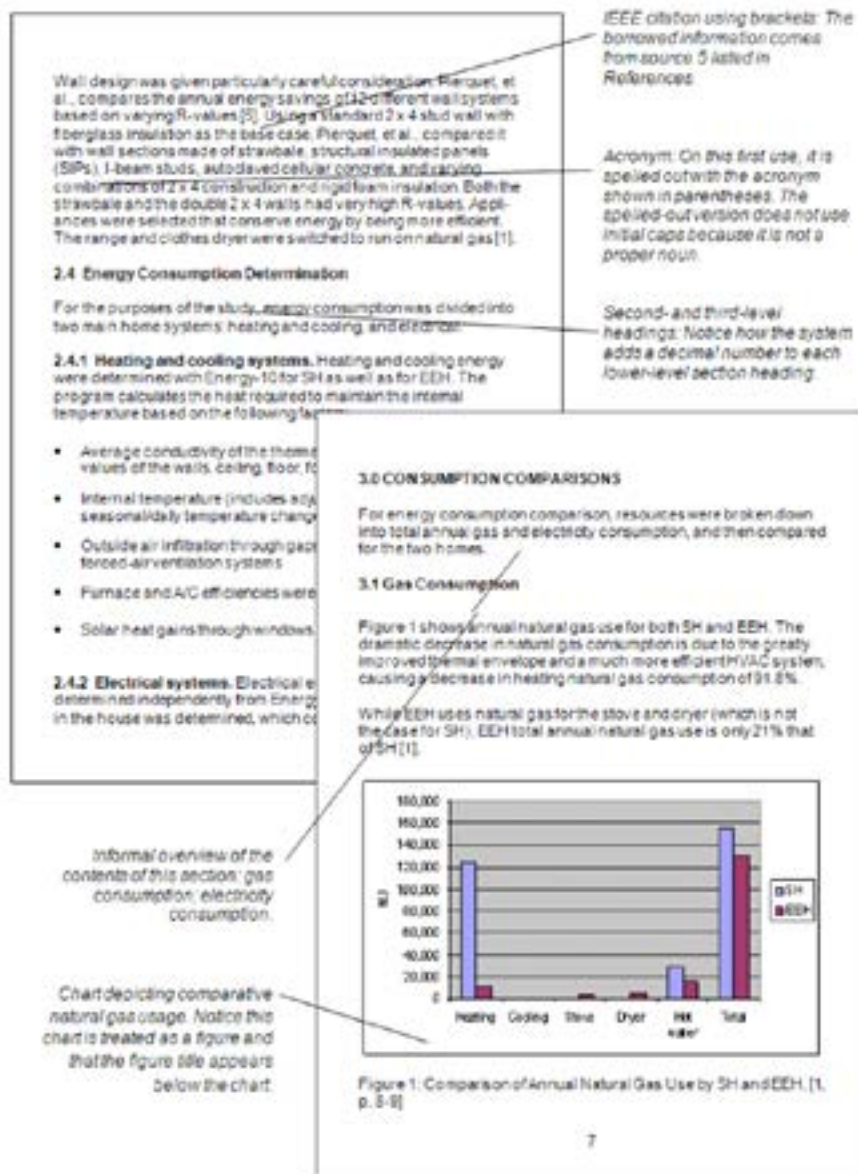The body of the report is of course the main text of the report, the sections between the introduction and conclusion. Illustrated in Figure 17 below are sample pages:

Figure 17: Excerpt from the body of a technical report

The body of your report will also most likely include the following:

HEADINGS

In all but the shortest reports (two pages or less), use headings to mark off the different topics and subtopics covered. Headings enable readers to skim your report and dip down at those points where you present information that they want.

BULLETED AND NUMBERED LISTS

In the body of a report, also use bulleted, numbered, and two-column lists where appropriate. Lists help by emphasizing key points, by making information easier to follow, and by breaking up solid walls of text.

SYMBOLS, NUMBERS, AND ABBREVIATIONS

Technical discussions ordinarily contain lots of symbols, numbers, and abbreviations. Remember that the rules for using numerals as opposed to words are different in the technical world. The old rule about writing out all numbers below 10 does not always apply in technical reports.

In a technical writing course, ask your instructor if the decimal-numbering style for headings is required. Also, a different documentation system may be required—not the IEEE, which is for engineers.

GRAPHICS AND FIGURE TITLES

In technical report, you're likely to need drawings, diagrams, tables, and charts. These not only convey certain kinds of information more efficiently but also give your report an added look of professionalism and authority.

CROSS-REFERENCES

You may need to point readers to closely related information within your report, or to other books and reports that have useful information. These are called cross-references. For example, they can point readers from the discussion of a mechanism to an illustration of it. They can point readers to an appendix where background on a topic is given (background that just does not fit in the text). And they can point readers outside your report to other information—to articles, reports, and books that contain information related to yours.

Note: Longer reports often use the page-numbering style known as folio-by-chapter or double-enumeration (for example, pages in Chapter 2 would be numbered 2-1, 2-2, 2-3, and so on). Similarly, tables and figures would use this numbering style. This style eases the process of adding and deleting pages.

CONCLUSIONS

For most reports, you'll need to include a final section. When you plan the final section of your report, think about the functions it can perform in relation to the rest of the report.

APPENDICES

Appendixes are those extra sections following the conclusion. What do you put in appendixes?—anything that does not comfortably fit in the main part of the report but cannot be left out of the report altogether. The appendix is commonly used for large tables of data, big chunks of sample code, fold-out maps, background that is too basic or too advanced for the body of the report, or large illustrations that just do not fit in the body of the report. Anything that you feel is too large for the main part of the report or that you think would be distracting and interrupt the flow of the report is a good candidate for an appendix. Notice that each one is given a letter (A, B, C, and so on).

INFORMATION SOURCES

Documenting your information sources is all about establishing, maintaining, and protecting your credibility in the profession. You must cite ("document") borrowed information regardless of the shape or form in which you present it. Whether you directly quote it, paraphrase it, or summarize it—it's still borrowed information. Whether it comes from a book, article, a diagram, a table, a web page, a product brochure, an expert whom you interview in person—it's still borrowed information.

Documentation systems vary according to professionals and fields. Engineers use the IEEE system, examples of which are shown throughout this chapter. Another commonly used documentation system is provided by the American Psychological Association (APA).

PAGE NUMBERING

Page-numbering style used in traditional report design differs from contemporary report design primarily in the former's use of lowercase roman numerals in front matter (everything before the introduction). Below are some tips for page numbering:

- All pages in the report (within but excluding the front and back covers) are numbered; but on some pages, the numbers are not displayed.

- In the contemporary design, all pages throughout the document use arabic numerals; in the traditional design, all pages before the introduction (first page of the body of the report) use lowercase roman numerals.

- On special pages, such as the title page and page one of the introduction, page numbers are not displayed.

- Page numbers can be placed in one of several areas on the page. Usually, the best and easiest choice is to place page numbers at the bottom center of the page (remember to hide them on special pages).

- If you place page numbers at the top of the page, you must hide them on chapter or section openers where a heading or title is at the top of the page.

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3.6 HOW DO YOU WRITE INSTRUCTIONS?

WRITING INSTRUCTIONS

Many people are used to following written instructions, but most people have never written instructions for another person. In many professional roles, you may have to write instructions. While some instructions may be simple and brief, other instructions may be more complex and take longer to complete. For this reason, it is important to know how to write useful instructions.

Writing useful instructions can be difficult because people read and comprehend things differently. For example, some people are visual learners and may have difficulty following written instructions. Readers also have a variety of educational backgrounds. When writing instructions, it is important to use a simple, logical style and format.

GUIDELINES FOR WRITING INSTRUCTIONS

When writing instructions, avoid persuasive language and take a task-based approach. Keep the writing concise and clear, and focus on the enabling the user to successfully accomplish the task.

In general, follow these guidelines:

CONCISENESS AND CLARITY

Keep sentences short and understandable. Use common terminology whenever possible. Avoid using idioms, slang, jargon, nicknames, abbreviations, and acronyms. If you do use terminology that might be new or confusing, clearly define each term when it first appears in the instructions.

AUDIENCE

Know your audience when writing instructions, so you include all necessary information and exclude unnecessary information. Knowing your audience allows you to make reasonable and well-informed assumptions based on the audience's likely background, experience, and familiarity with the subject. For example, if you are writing instructions for a group of senior citizens at the local branch of the public library, it may not be safe to assume that they are familiar with the basics of opening a specific software application. However, if you are writing instructions for a group of software developers within a professional organization, it may be safe to assume that they are familiar with the basics of opening a specific software application.

When deciding what information to include and exclude from instructions, clearly identify who your audience is and what their likely proficiency is with the topic of the instructions and related background information.

If an audience is likely to have a wide range of experience and knowledge that includes varying levels of familiarity and expertise, you can use various techniques to keep each set of instructions concise and focused on a single task, while still providing necessary information. For example, you can create separate instructions for prerequisite information and provide your audience with the means to quickly and easily access the separate instructions (through hyperlinks, appendices, etc.).

GRAPHICS

Adding graphics to convey your thoughts may be more effective than the words themselves. Instructions that are well illustrated and accompany your written instructions can be highly successful. Visuals add an extra level of understanding and allow the reader to skim or troubleshoot if problems occur. Pictures add an additional dimension that will allow your reader to visualize the end product. When using graphics you should be mindful of those visual learners and adapt the graphics.

Although pictures are great, you must be cautious not to include photographs or illustrations that are confusing or not associated with the actual written instructions. If you pair a poor picture with your instructions, you might cause the reader stress or introduce confusion when trying to decipher what you mean.

When taking pictures, ensure that the area is well lit and the pictures are clear and bright. Dark or fuzzy pictures are often difficult to follow. Take care to photograph the subject in the same orientation each time to avoid confusion and consider using a tripod.

Size is also important when using images in instructions. A picture that is too small to see is just as useless as a blurry image.

To be powerful and understandable, your text and graphic for each step should clearly correlate to that step of the instructions.

FORMATTING

Remember that the readers will actually be performing the task as they read along with the instructions, so you should not use solid blocks of small, hard-to-decipher text. Make sure to create a design and layout for your instructions page that will allow easy readability and add aesthetic quality. Keeping the page simple, but with a defined hierarchy, will assist the reader in completing the steps of the instructions.

When designing your page, a solid hierarchy is important for scan-ability. The use of bold headings, italics, and roman numerals will aid the reader in finding their place easily and help with the overall visual appearance.

ORDER

Technical instructions must flow in a logical pattern. Make sure to state the problem clearly on the first page. Follow your problems with a set of specific steps detailing how to solve the proposed problem. Focus on the logic of each step. For example, when assembling a table it would not be good if you put the finishing touches on it before you had all the screws in place. As stated, there should also be clear graphics where necessary to clarify the action.

TESTING AND VERIFICATION

Instructions are difficult to write; sometimes your text might sound good on paper, but when you actually attempt to put the instructions to use, you might find that your wording makes no sense to others. Remember what might be common or obvious to you might baffle your readers, so know your audience. In addition to testing your instructions on yourself, ask someone who knows nothing about your product to test it. This is called a usability study. Take notes on what worked and what didn't and then revise your instructions accordingly. In the long run the more people that test your instructions, the more effective the final set will be.

TAILORING INSTRUCTIONS TO THE INTENDED AUDIENCE

Tailoring your instructions to the intended audience can be one of the most difficult tasks of your writing process. Before you begin your writing process you need to identify who your audience will be and how you can tailor your instructions to make them as understandable as possible. To help you do tailor, ask yourself the following questions:

- *What background might your audience members have, and what prior knowledge might they possess?* This question will help you to determine what you will need to include or not include in your instructions.

- *What are your audience's needs/interests?*

- *How will your audience's demographics affect how you write?* If the majority of your audience comes from a different demographic than you, you need to take language into consideration and make sure graphics are clear.

- *Is there a variability in your audience?* If your audiences are composed of people with varied backgrounds, your writing should be tailored to the majority of your audience, and you may also consider adding additional information in the appendices.

Based on your answers to the above questions, there are several ways you can ensure that your instructions will be as clear as possible to your readers:

- Add information (such as tips, side notes) the readers will need in order to understand your instructions and ensure no key information is missing.

- Do not add unnecessary information; it may confuse or mislead your readers.

- Make sure the document is at the level of your audience.

- Add examples/graphics. Graphics can be very helpful to a reader.

- Have a clear organizational structure. Lack of organization can create confusion and frustration in your readers.

WRITING YOUR INSTRUCTIONS

The following sections are descriptions of the different parts of the general superstructure of a set of instructions. What sections to include will vary based on the complexity of the instructions. Your document may contain any of the following sections:

- Introduction
- Description of Equipment

- Materials and Equipment Necessary

- Procedures

- Visual aids

- Troubleshooting

INTRODUCTION

What is included in your introduction will depend on what your instructions are for and who will be using them. In any case, the introduction should be brief, but still informative. The introduction can include any or all of the following sections:

- **Subject/Aim**: Indicate the specific task that will be explained and what the outcome of the procedure will be.

- **Intended Readers**: Identify who the intended readers of the instructions are and if the reader will need additional knowledge or background in order to complete the task.

- **Scope**: Give this information to help the reader to know if the instructions will help them complete the task they want to or not.

- **Organization**: Give the reader an overview of what the rest of the instructions will look to help them more easily understand the steps. This section could also go under the scope section.

- **Safety**: Inform the readers of any hazards or dangers that could occur while they are completing the task. You need to display warnings in a clear and understandable fashion.

DESCRIPTION OF EQUIPMENT

If there is equipment that the reader will have to use in order to operate or repair a piece of equipment, you may want to include a description of it in this section.

MATERIALS/EQUIPMENT LIST

Provide a list of equipment that the reader will need to accomplish the task so they know if they need additional tools or things they may not normally have. A list of supplies is also helpful for a reader to make sure that they have all the parts and pieces they need.

PROCEDURE

This section is the most important part of an instructions set since it is the actual steps that the reader will follow to complete the task at hand. There are

many ways to format the procedures, but most are done with numbered lists. The following are things you should do to make the steps clear and concise:

- Write each step with concise wording so it is easily understood and completed.

  - Give readers enough information to perform the step and avoid redundancy.

  - Put the steps in a list. Numbering often works the best.

  - Highlight key words.

- Make sure the reader can locate steps quickly and easily.

  - Number steps.

  - Skip lines between steps.

- Make actions stand out from the rest of the text.

- Tell the reader what to do if they make a mistake. Not knowing what to do can cause frustration and the reader may give up on the task.

VISUAL AIDS

The use of graphics and pictures to correspond to each step is highly recommended. Each person has different learning habits; some like text while others are better off with pictures. The presence of graphics also allows the reader to make sure they are still on the right track. In most situations it would be beneficial to have a combination of both graphics and words.

TROUBLESHOOTING

Instructions should include this section to tell the reader what to do if something goes wrong during the building process or if the completed project does not look like the expected outcome. Putting this information into a table format often works the best.

For an example set of instructions visit [1]. This webpage contains information from the textbook entitled Power Tools for Technical Communication by David A. McMurrey.

USABILITY TESTING

Usability testing is a crucial step in preparing an effective set of instructions. Once you have completed a draft of your instructions, it is important to test them to see where improvements can be made. A usability test should be performed on multiple testers for each updated draft of your instructions. Here are the steps to performing a usability testing:

1. Choose your testers from a group that is representative of your intended audience. In order to single these specific users out, you may need to ask a few preliminary questions. For example, you can ask what their experience level with the task is or what their job field is.

2. Choose how you will evaluate the tester's performance in completing the task. There are different methods to choose from, but one method is called the "Think Aloud" method. When using this method you ask your tester to complete the task using your instructions while verbalizing everything that is going through their head as they go through the instructions. Do not offer any help to the tester as he or she goes through the test; kindly tell them that you can answer their questions at the end. As the tester says what is confusing or hard, you take notes. You can record this information in a chart that has three columns.

   In the first column you will record the problems your tester had. In the second column you write down what the possible cause of each problem was. In the third try to generate a possible solution to the problem or possible ways you can change your instructions to make them more understandable. Be sure to be descriptive in what you want to find out. Be sure to lay out testing form to collect all pertinent information about your testing so no information is overlooked or misplaced.

3. After the test is done look at your notes and ask the tester to elaborate on the problems that you noted. This is an important step because you are getting direct feedback from your audience. Make sure that you understand exactly what was confusing for them, as this feedback will help you in writing the most successful set of instructions. Ask testers how you could change that step or part of the instructions to make them unambiguous.

4. Based on your findings edit and update your instructions. After you do so, your writing should be more understandable and easier to follow for your intended audience. In many cases it is appropriate or even necessary to conduct one or more rounds of usability tests as you perfect your instructions. More testing may prove beneficial in discovering problems that were overlooked the first round of testing or because the problems may have been masked by original complications. If time permits, run as many rounds of usability testing as needed.

   Note: Pay special attention to your intended audience and ensure that you have the number of testers and accurate demographics necessary to accurately represent your sample. For example, if you are making instructions for a "beginner" audience and test on an "expert" audience your sample will not be representative. In addition, if you are wanting to make instructions for a large audience of several ages, genders, and

experience levels, your sample will need to be large and representative of that population.

Additionally, if the instructions require the tester to use both hands (like tying a tie), consider making all the instructions visible without turning pages so it is easier for them to complete the task.

GENERAL WRITING STYLE TIPS

Many people resist reading instructions. They try to figure out for themselves how to operate a product or perform a task and will turn to the instructions only if all of their efforts fail. When they do read the instructions, they want to understand everything immediately without having to read anything twice. A simple design, plain wording, and clear instructions will be critical to encouraging readers to pay attention to your instructions or procedures.

When writing technical documents and instructions there are several style tips you should keep in mind:

- Use a lot of imperative, command or direct address, kinds of writing. It is OK to use "you" when writing instructions, because you are addressing the reader directly.

- Use active instead of passive voice.

- Generally, do not leave out articles such as a, an and the.

- Use action verbs.

- Ensure graphics match descriptive text to avoid confusion.

- Label graphics by steps; for example, "Step 17: ...Put...," the graphic should be labeled clearly with a number "17" or if multiple graphics exists for a line of text writing in chronological order, "17a, 17b, etc." or if different views, "17 front, 17 back, etc."

- Keep text short but descriptive.

- Avoid complicated jargon; use simple verbiage to ensure understanding by a broad spectrum of users.

- Use concise headings and subheadings to describe and highlight each section.

- Leave plenty of white space around headings.

- Highlight safety information and warnings.

- Keep illustrations as simple as possible.

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3.7 WHAT ARE THE CONVENTIONS OF EMPLOYMENT MATERIALS?

JOB SKILLS CHECKLIST

SUMMARY:

This handout provides a large skills inventory list that you can use to help build your resume and cover letter.

Contributors: Purdue OWL

Last Edited: 2010-04-25 08:51:10

PURPOSE:

The purpose of this skills inventory is to help you to be able to come up with different skills that you may be having a hard time thinking of yourself.

How to use the Skills Inventory: The following is a sample list of skills found in a cross section of careers. Circle every skill that applies to you. Jot down examples of situations in your working life that demonstrate this skill. Then try to incorporate these skills into your resume and/or cover letter. Good Luck!

Table 1:

administering programs	planning agendas/ meetings	updating files
advising people	planning organizational needs	setting up demonstrations
analyzing data	predicting futures	sketching charts or diagrams

assembling appratus	rehabilitating people	writing reports
auditing financial reports	organizing tasks	writing for publication
budgeting expenses	prioritizing work	expressing feelings
calculating numerical data	creating new ideas	checking for accuracy
finding information	meeting people	classifying records
handling complaints	evaluating programs	coaching individuals
handling detail work	editing work	collecting money
imagining new solutions	tolerating interruptions	compiling statistics
interpreting languages	confronting other people	inventing new ideas
dispensing information	constructing buildings	proposing ideas
adapting new procedures	coping with deadlines	investigating problems
negotiating/arbitrating conflicts	promoting events	locating missing information
speaking to the public	raising funds	dramatizing ideas
writing litters/papers/ proposals	questioning others	estimating physical space
reading volumes of material	being thorough	organizing files
remembering information	coordinating schedule/ times	managing people
interviewing prospective employees	running meetings	selling products
listening to others	supervising employees	teaching/instructing/ training individuals
relating to the public	enduring long hours	inspecting physical objects
entertaining people	displaying artistic ideas	distributing products
deciding the uses of money	managing an organization	delegating responsibility
measuring boundaries	serving individuals	mediating between people

counseling/consulting people	motivating others	persuading others
operating equipment	reporting information	summarizing information
supporting others	encouraging others	delegating responsibilities
determining a problem	defining a problem,	comparing results
screening telephone calls	maintaining accurate records	drafting reports
collaborating ideas	administering medication	comprehending ideas
overseeing operations	motivating others	generating accounts
teaching/instructing/ training individuals	thinking in a logical manner	making decisions
becoming actively involved	defining performance standards	resolving conflicts
analyzing problems	recommending courses of action	selling ideas
preparing written communications	expressing ideas orally to individuals or groups	conducting interviews
performing numeric analysis	conducting meetings	setting priorities
setting work/committee goals	developing plans for projects	gathering information
taking personal responsibility	thinking of creative ideas	providing discipline when necessary
maintaining a high level of activity	enforcing rules and regulations	meeting new people
developing a climate of enthusiasm, teamwork, and cooperation	interacting with people at different levels	picking out important information
creating meaningful and challenging work	taking independent action	skillfully applying professional knowledge
maintaining emotional control under stress	knowledge of concepts and principles	providing customers with service
	knowledge of community/ government affairs	

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3.8 HOW DO YOU MANAGE YOUR ONLINE IDENTITY?

In 2008, while working as a career counselor, a student came into my office to discuss her difficulty securing an internship prior to graduation. On paper, she was a phenomenal candidate—3.8 GPA, active in student government, successful athlete, and in possession of solid letters of recommendation from her instructors, coaches, and past employers. Despite her many strengths, she had interviewed with seven prospective employers throughout her junior year but was unable to secure the internship that was required by her academic program. Perplexed, I called up a recruiter I knew from one of the companies she interviewed with and asked him to describe the hiring process for internships. In addition to the basics (i.e. phone interview, in-person interview[s], and reference checks), his company had begun e-screening applicants; he explained that the top candidates were ranked following the in-person interviews and were subsequently vetted by Human Resources which included an examination of public social media profiles and a general search of popular search engines. The student and I then conducted our own searches for her and quickly identified her problem. Although this student was a qualified candidate, negative information online created a professional roadblock.

Today, there remains little doubt that social media has had a huge impact on the way business is conducted. Worldwide, more than 800 million users log onto social media sites (like Facebook and Twitter) every month, including 7.5 million college students in the United States alone (Maxwell 47; Peluchette & Karl 30). Unbeknownst to many of these users, employers have begun reviewing social media profiles when screening candidates for employment. A recent CareerBuilder survey suggested that approximately 45% of U.S. employers are currently accessing social media sites to research applicants.

Furthermore, the survey also indicated that 35% of respondents reported dismissing candidates based upon information provided in their social media profiles ("One-in-Four"). While the employers seem to be increasingly aware of what is going on in the digital world, new evidence suggests that college students are not as concerned with their own online activities, with more than 50% of sampled college students posting content deemed "inappropriate" by employers on their social media pages; this content often includes evidence of underage alcohol abuse, semi-nude photos, and profanity directed at peers, teachers, and current employers (Peluchette & Karl 30). If you are a college student, you are preparing to enter one of the most competitive and hostile job markets in U.S. history, and as such, you should be aware of the real-world consequences of your virtual activities. Often, you may post information online that is intended for one audience, unaware of the effect that this content has on unintended viewers, but a simple three-step process of reflection, revision, and reinvention could help to mitigate these consequences.
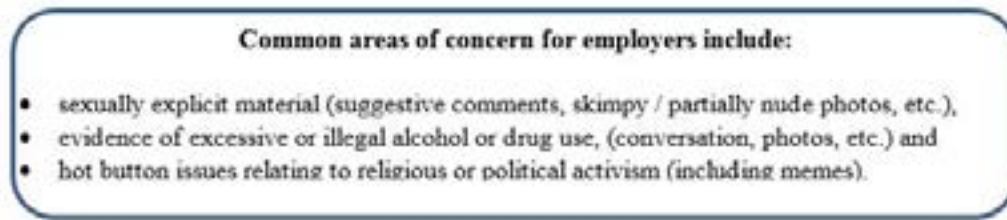
MANAGING YOUR ONLINE IDENTITY: A 3-STEP STRATEGY

An evaluation of online presence should be a regular part of your job search preparation. Although it is difficult to completely revamp your entire online identity, there are several steps that can bolster your virtual curb appeal for prospective employers. The most effective strategy for doing so actually involves a three-step process of reflection, revision, and reinvention.

REFLECTION

To begin overhauling your online presence, a period of reflection is necessary to honestly evaluate your personal values, beliefs, and activities to ensure that they are compatible with your professional aims. Although this may prove to be a challenging process, one of the best ways to start out is to examine the impact online activities have on others. For example, an online search of the keywords "denied degree social media" will ultimately lead you to the story of Stacy Snyder, a woman who was denied a teaching degree from Millersville University of Pennsylvania, due (at least in part) to her online activities via MySpace (Krebs). Likewise, a search for the terms "fired over Facebook remarks" will return the story of Wisconsin Department of Transportation Executive, Steven Krieser, detailing how he was fired after posting Facebook comments about illegal immigration (Richmond). There are many cases where the impact of seemingly innocuous online activities can affect your employability in the real world. Ultimately the decision to include or omit any content on social media must be made by you as an individual, but it is vital to recognize that those decisions have consequences.

Figure 18: Common Employer Concerns

Common areas of concern for employers include:

- sexually explicit material (suggestive comments, skimpy / partially nude photos, etc.),
- evidence of excessive or illegal alcohol or drug use, (conversation, photos, etc.) and
- hot button issues relating to religious or political activism (including memes).

REVISION

After identifying the areas where your online presence could be improved, try to make revisions where possible. The focus of this process should remain on your social media presence(s). Take care to delete inflammatory comments, questionable photos, and personal information that may alienate members of your prospective audience. At times, you may notice that your posts may not be as concerning as the comments posted by your friends. During this process, you will not only be revising your individual persona, but you may also need to consider who you want as members of your social network or even which social networks and what social networks you want to join. If some of your friends are posting controversial or risqué material, some employers will find you guilty by association, so unfriending some of your social media friends may help to distance yourself from those behaviors. Again, the choice of what to revise is an individual one, but these decisions will have repercussions.

Privacy settings are another area that you should understand when revising your social media presence. The ongoing commodification of social media means that it is in the best interest of social media sites to create open, transparent networks. Because of this motivation, site administrators constantly change default settings with system updates, which users must opt out of. For example, in 2010, you may have changed your privacy settings to the highest level possible at the time, only to realize that when your profile migrated to timeline format, friends of your friends can now access your content, as well. This means that a profile that you once thought hidden can now be accessed by an employer who has friended your classmate who had an internship with their organization last summer. Similarly, posts and pages that you like on social media are also, by default, visible to the public, and those likes tell a lot about who you are. The only way to know for sure who can see what information is to continually monitor your privacy settings to ensure that they have not been changed by system administrators.

REINVENTION

After revising your social media presence, it is time to address the information that is digitally archived by Internet search engines. On some occasions, questionable content can be removed by contacting individual website administrators and making a simple request; however, as most information online is virtually impossible to remove, a more proactive strategy can help you make that information much less noticeable.

Understanding how search engines rank results is important to devising a strategy that works best for you. Whichever search engine is used, top ranked results will appear fairly similar, as they are ranked according to similar criteria. Although your name may be mentioned a million times online, not all sources are created equal. Search engines will organize findings according to relevance and popularity. Webpages that receive a significant amount of traffic or that are linked to many other sites will appear earlier in the results than less prominent pages. Public profiles on popular social media sites (e.g. Facebook, Twitter, LinkedIn, etc.) will usually appear earlier in searches for this reason. In addition to popularity, sites will also be ranked according to their relevance. This means that webpages that contain specific keywords, use the person's name in the URL, or that are more recent will often appear earlier in the results than older, or more fragmented information.

To use these search engines to your advantage, consider creating your own professional webpage or blog that integrates your name into the URL. In doing this, search engines will automatically register that website as being more relevant than other search results. As these pages gravitate to the top of your search results, older, less relevant, and less appealing entries will drop further down the list, making them less likely to draw an employer's attention. As you build your professional webpage or blog:

Figure 19: Content To Carefully Consider or Avoid on Your Website

Avoid (unless directly relevant to the industry in which you plan on working):

- personal hobbies (hunting, snowmobiling, recreational sports, etc.),
- personal or family details (birthdate, siblings, hometown, religious affiliation, etc.), and
- out dated information (high school activities)
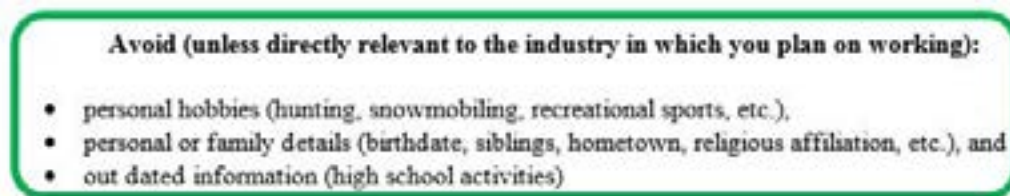
Figure 20: Contents to Consider Adding to Your Website

Consider including the following on your professional blog or website:

- a professional profile that outlines your professional goals and objectives,
- an electronic portfolio that showcases academic or internship projects, and
- an up-to-date resume that contextualizes your achievements, skills, and experience.
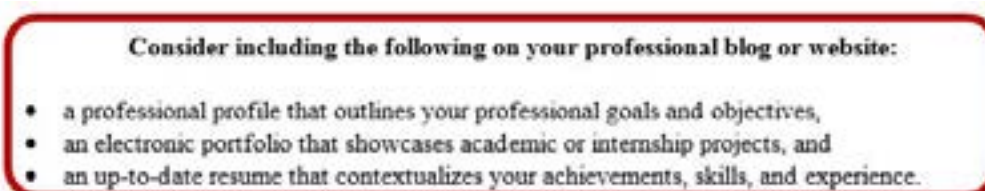
Finally, link digital spaces that you occupy to create a more complete image of yourself online. Including links to your accounts on Facebook, Twitter, and LinkedIn will ensure that your employer is more easily able to navigate and evaluate your online identity. Often, when conducting personnel searches, employers may locate profiles from different people with similar names. Connecting professional spaces makes it easy for an employer to navigate profiles, ensuring that your profile is not misidentified. These mix ups can occur; organizing your information effectively online ensures that you do not pay the price for someone else's content.

CONCLUSION

It is important to recognize that, in today's digital age, we all are living an increasingly public existence, whether we want to or not. Some may choose to avoid a social media presence all together, but evasion may not be the answer as corporate entities are using digital media to more effectively connect with their target demographics. Your total absence may imply that you are not tech savvy or are out of touch with current trends. Likewise, overuse or unprofessional use of this same media can paint you as a liability for an organization looking to maintain a certain image in both the digital and real worlds. Reflecting upon the digital spaces you currently occupy, revising content, and creating new, more professional spaces will hone your online persona to connect more effectively with prospective employers, proving that you have the skills, knowledge, and identity to be successful with any organization.

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CHAPTER 4
PROJECT MANAGEMENT AND USABILITY

4.1 WHAT IS USER EXPERIENCE?

USER EXPERIENCE BASICS

User experience (UX) focuses on having a deep understanding of users, what they need, what they value, their abilities, and also their limitations. It also takes into account the business goals and objectives of the group managing the project. UX best practices promote improving the quality of the user's interaction with and perceptions of your product and any related services.

FACTORS THAT INFLUENCE UX

At the core of UX is ensuring that users find value in what you are providing to them. Peter Morville represents this through his User Experience Honeycomb in Figure 21.

Figure 21: Information used to create meaningful and valuable UX.

Morville notes that in order for there to be a meaningful and valuable user experience, information must be the following:

- **Useful:** Your content should be original and fulfill a need

- **Usable:** Site must be easy to use

- **Desirable:** Image, identity, brand, and other design elements are used to evoke emotion and appreciation

- **Findable:** Content needs to be navigable and locatable on-site and off-site

- **Accessible:** Content needs to be accessible to people with disabilities

- **Credible:** Users must trust and believe what you tell them

AREAS RELATED TO BUILDING THE USER EXPERIENCE

UX is a growing field that is very much still being defined. Creating a successful user-centered design encompasses the principles of human-computer interaction (HCI) and goes further to include the following disciplines:

- **Project Management** focuses on planning and organizing a project and its resources. This includes identifying and managing the lifecycle to be used, applying it to the user-centered design process, formulating the project team, and efficiently guiding the team through all phases until project completion.

- **User Research** focuses on understanding user behaviors, needs, and motivations through observation techniques, task analysis, and other feedback methodologies.

- **Usability Evaluation** focuses on how well users can learn and use a product to achieve their goals. It also refers to how satisfied users are with that process.

- **Information Architecture (IA)** focuses on how information is organized, structured, and presented to users.

- **User Interface Design** focuses on anticipating what users might need to do and ensuring that the interface has elements that are easy to access, understand, and use to facilitate those actions.

- **Interaction Design (IxD)** focuses on creating engaging interactive systems with well thought out behaviors.

- **Visual Design** focuses on ensuring an aesthetically pleasing interface that is in line with brand goals.

- **Content Strategy** focuses on writing and curating useful content by planning the creation, delivery and governance behind it.

- **Accessibility** focuses on how a disabled individual accesses or benefits from a site, system or application. Section 508 is the governing principal for accessibility.

- **Web Analytics** focuses on the collection, reporting, and analysis of website data.

LICENSES AND ATTRIBUTIONS

Elements of User Experience diagram by Jesse James Garrett

User Experience Honeycomb diagram by Peter Morville

The Elements of User Experience: User-Centered Design for the Web and Beyond (2nd Edition) by Jesse James Garrett

"Usability" U.S. Dept. of Health and Human Services by Usability.gov. (Unless otherwise noted, text, documents, and images on the Usability.gov website are in the public domain, are not copyrighted, and therefore may be copied and distributed at no cost).

4.2 WHAT IS PROJECT MANAGEMENT?

PROJECT MANAGEMENT BASICS

Project management focuses on planning and organizing a project and its resources. This includes identifying and managing the lifecycle to be used, applying it to the user-centered design process, formulating the project team, and efficiently guiding the team through all phases until project completion.

VALUE OF PROJECT MANAGEMENT

Through proper project management, you can assure that the purpose/vision and goals of the project are maintained, all while supporting the audiences' tasks and objectives. Additionally, you avoid risks and effectively and efficiently use your available resources. It also helps the team members to understand their responsibilities, the deliverables expected, and the schedule everyone needs to follow to complete the project on time and within budget.

AREAS WITHIN PROJECT MANAGEMENT

The Project Management Institute (PMI) has identified nine areas of knowledge within project management:

1. integration management
2. scope management
3. time management
4. cost management
5. quality management

6. human resource management

7. communication management

8. risk management and

9. procurement management

BUILDING A TEAM AND ENCOURAGING COMMUNICATION

Depending on your project needs, the size of your team and the roles needed may vary. Keep in mind that members on your team may fulfill one role or may fulfill many.

Regardless of the size of the team, it's important to identify how the team will communicate and collaborate with one another. This includes the following upfront:

- Planned/ regular meetings

- How formal they will be

- Whether meetings will be held in-person, virtually, or both

- How the team will share and collaborate on documents

- Where documents will be stored and how they will be version controlled

- Workflow for decisions and approval

PROJECT PHASES, LIFE CYCLES, AND INCORPORATING USER-DESIGN PRINCIPLES

Projects are typically broken down into phases. Each phase outlines the work that needs to be done and who is involved. Generally, in order for a phase to be considered complete, specific deliverables need to have been completed and handed off. Some project teams, however, do choose to implement fast tracking, which is when phases are overlapped.

A lifecycle defines the beginning and end of the project; it represents all of the phases together. When defining the project's life cycle, the first phase is noted as Step 0. It usually captures the visioning and conceptualizing of the project. According to the Project Management Institute, most life cycles have four or five phases but some may have more.

The most common lifecycle approaches are Waterfall and Agile, regardless of the approach you choose, you will need to incorporate user-centered design (UCD) best practices and methods. At a high-level, the UCD process includes the following steps: planning, collecting and analyzing data, writing content, designing and developing prototypes of the system, and testing.

PROJECT PLAN AND CHARTER AGREEMENT

When defining your project, it is important to come up with a project plan that the team agrees to upfront so that it can serve as a reference point throughout the project. Make sure when outlining your plan, that throughout it you note how you plan to include user-centered design best practices and methodologies. Most project plans outline the following:

- Objectives

- Scope, which correlates to the requirements

- Resources, including technology, budget, and team roles and responsibilities

- Schedule

- Assumptions

- Dependencies

- Risk assessment and management plan

- Change control plan

At the end of the project plan, depending on your team's needs, you may choose to include a charter agreement. A charter agreement is typically a one page document that has the sponsor of the project sign off that they agree to the work to be done as outlined by the team in the project plan. Remember, however, that successful teams understand upfront that things happen and that they'll need to adapt. The project plan establishes the baseline for how you assume the project will happen and then provides information about the process for taking changes into account, should they arise.

CREATING A SCHEDULE

Schedules are an important part of project management because they help you measure your progress as the project moves along. They also help to outline how each team member's part fits into the overall picture and demonstrate the dependencies.

Schedules reflect the life cycle broken down into specific deliverables and touch points. It defines what needs to be done and who is the point of contact responsible for the work.

DEVELOP A PROJECT PLAN

A project plan takes into account the approach the team will take and helps the team and stakeholders document decisions made regarding the objective, scope, schedule, resources, and deliverables.

It is important to include usability activities in your project plan, so you can build in the time and resources to carry out those activities. Review the [step-by-step](#) usability guide to better understand which activities fit your needs to include in your plan.

DEFINE THE SCOPE AND STAY ON TRACK

The project scope identifies what needs to be accomplished for the project to be considered complete. When discussing scope, it's important to ask the following questions:

- What product is being developed?

- What information is going to be covered? Will it feature a particular topic or is it for a particular audience?

- What is the size of the product (i.e. how many pages will the site contain)?

- Are you creating a website for an entire agency or organization? Is the site for part of that agency or organization?

- What amount of research do you intend to pursue? Is there time built in for incremental adjustments based on those findings.

Gather more detailed questions on [how to hold a kick-off meeting](#).

For a project to stay on track, it's important to avoid scope creep. Scope creep refers to when there are things incrementally added the project plan that are individually doable when piled together endanger successful completion of the project as previously defined. Scope creep can be on the business front or the technical front.

IDENTIFY TARGET AUDIENCES

At the beginning of the project, it's vital to think about the audience you are trying to reach, the tasks they come to complete, and how addressing those needs compare to that of your organization. It is important to avoid being broad when defining your target audiences.

To identify and analyze audiences for an existing site, you can gain insight from the site's analytics, performing market research, and conducting user research methodology. For new sites, you may need to rely on market research for initial insight and then refine through conducting additional user research techniques.

SET MEASURABLE OBJECTIVES

Think about your website and define objectives that consider what your organization hopes to achieve. When you set meaningful objectives and set targets to reach, you have the ability to measure success after the site launches.

There are two types of goals/ objectives to consider:

- User goals are users' task scenarios. They explore what users come to the website to achieve.

- Usability goals should measure your users' ability to accomplish tasks on your site. This will tell you whether your site is effective, efficient, and satisfying to your users.

An example objective, if you want users to get the answers to their own questions without calling your agency or organization, is to reduce phone calls by X amount, saving Y dollars. You can set similar objectives for reducing emails, increasing customer satisfaction, and increasing subscriptions to online newsletters.

LICENSES AND ATTRIBUTIONS

"Project Management" by Usability.gov. (U.S. Dept. of Health and Human Services). The Research-Based Web Design & Usability Guidelines, Enlarged/Expanded edition. Washington: U.S. Government Printing Office, 2006. (Unless otherwise noted, text, documents, and images on the Usability.gov website are in the public domain, are not copyrighted, and therefore may be copied and distributed at no cost. https://www.usability.gov/about-us/index.html)

4.3 WHAT IS USER TESTING?

USER TESTING AND RESEARCH BASICS

User testing and research focuses on understanding user behaviors, needs, and motivations through observation techniques, task analysis, and other feedback methodologies. Mike Kuniaysky, a specialist in User Experience, notes that it is "the process of understanding the impact of design on an audience."

The types of user research you can or should perform will depend on the type of site, system, or app you are developing, your timeline, and your environment.

WHEN TO PERFORM USER RESEARCH METHODS

Below are examples of the types of research you could perform at each phase of your project. This information is guided by the user-centered design (UCD) process. A methodology may appear in one or in several phases.

Table 1:

Methods	Know Your User	Content	Design	Test & Refine
Card Sorting - This method helps ensure that the site structure matches the way users think by allowing users to group your site's information.	YES	YES	NO	YES

Contextual Interviews - A method that enables you to observe users in their natural environment, giving you a better understanding of the way users work.	YES	NO	NO	NO
First Click Testing - A testing method focused on navigation, which can be performed on a functioning website, a prototype, or a wireframe.	NO	YES	YES	YES
Focus Groups - A moderated discussion with a group of users that allows you to learn about user attitudes, ideas, and desires.	YES	YES	YES	NO
Heuristic Evaluation/ Expert Review - A group of usability experts evaluating your website against a list of established guidelines.	YES	NO	NO	YES
Individual Interviews - One-on-one discussions with users show you how a particular user works. These discussions enable you to get detailed information about a user's attitudes, desires, and experiences.	YES	YES	YES	YES
Parallel Design - A design methodology that involves several designers pursuing the same effort simultaneously, but independently, with the intention to combine the best aspects of each for the ultimate solution.	NO	NO	YES	NO
Personas - The creation of a representative user based on available data and user interviews. Though the personal details of the persona may be fiction, the information used to create the user type is not.	YES	NO	NO	NO

Prototyping - Creation of a mock-up of the site, which allows the design team to explore ideas before implementing them. A prototype can range from a paper mock-up to interactive html pages.	NO	NO	YES	YES
Surveys - A series of questions asked to multiple users of your website, which helps you learn about the people who visit your site.	YES	YES	YES	YES
System Usability Scale (SUS) - SUS is a technology-independent ten item scale for subjective evaluation of the usability.	NO	NO	NO	YES
Task Analysis - A method where you learn about user goals, including what users want to do on your website; this method helps you understand the tasks that users will perform on your site.	YES	NO	NO	NO
Usability Testing - One-on-one sessions where a "real-life" user performs tasks on your site. This method identifies user frustrations and problems with your site.	YES	YES	YES	YES
Use Cases - A description of how users use a particular feature of your website. This method provides a detailed look at how users interact with the site, including the steps users take to accomplish each task.	NO	YES	YES	NO

BEST PRACTICES

During Project Planning you should do the following:

- Consult the UCD Guide for a step-by-step visual map to guide you through the user-centered design process.

- Consider when testing can be incorporated in your schedule

  - Test early and often

- Define the target audience(s) for the site. This will assist the UX team in the following:

  - Creating a screener

  - Recruiting participants

  - Defining Personas

  - Identifying tasks for testing

RECRUITING PARTICIPANTS & THE LEGEND OF "THE GENERAL PUBLIC"

If you have ever tried put together any user experience testing, especially for the government, at one point or another your client may have said that their target audience is the "general public." Your conversations may have sounded something like this:

Question: "Who is the target audience for this site?"

Answer: "The General Public"

Question: "Who would you like us to bring in for usability testing?"

Answer: "The General Public"

Question: "Who should be involved in this card sort?

Answer: "The General Public"

Unfortunately, many believe the "general public" is well suited for any test, survey, or focus group. The thing is that using the non-descript "general public" isn't helpful because it doesn't exist. So your critical task in recruiting for tests – and also in designing – is to get more specific and identify what your team really means when they say the "general public."

Knowing who your target audiences are and identifying their top tasks is a critical part of designing your site and forming an effective content strategy. This audience analysis can be done through various market research, user research, and web analytics techniques. When it comes to testing, being able to draw on those established audience groups and recruiting representative

participants is fundamental to yielding useful results and the acceptance of your insights and recommendations.

IDENTIFYING YOUR PARTICIPANTS

When identifying test participants, create a list of the traits, characteristics, or experience you will need in a participant based on metrics or discussions with your client or team. This information will help you develop the recruiting criteria and screener you will use to recruit participants.

At a high level, here are some of the things your recruiting criteria and screener should cover:

Table 2:

Age Range	• What are the age ranges? • How many do you need in each range?
Gender	• Gender type? • How many of each gender?
Ethnicity	• Which ethnicities? • How many of each ethnicity?
Education	• Level(s) (Examples: high school or GED degree, business or trade school, associates degree, bachelor's degree, master's or doctorate) • Distribution at each education level
Language	• Primary or target language
Familiarity	• Level of desired familiarity with the service, subject, or technology
Previous Usage	• Previous usage of the service, subject, or technology
Technology qualifications	• The use of specific hardware, software, or devices
Internet	• Level/frequency of internet use

Special qualifications	• Job history
	• Health history (including past tobacco use)
	• Personal history
	• Living environment
	• Family environment
	    • Children
	    • Marital Status

Here are a few example templates available for you to adapt for your own use:

- [Usability Test Screener: Website (example 1)](#)
- [Usability Test Screener: Website (example 2)](#)
- [Usability Test Screener: Online Survey](#)
- [Usability Test Screener - Mobile Device Testing](#)
- [Usability Test Screener: Government website](#)

KNOWING WHERE TO LOOK

Once you identify who you are testing, you must address where you can find your participants. In many cases, the list you generate will dictate the location for your search and, in some cases, your test methodology as well.

USING AN AFFILIATION TO FIND PARTICIPANTS

Having an affiliation with an organization can help you find participants that meet your criteria. For example, if your recruiting criterion includes retired service personnel who assist returning veterans blinded during service, it may look something like:

- Level of desired familiarity with the service, subject or technology
  - They must be familiar with the site
- Previous usage of the service, subject or technology
  - Weekly visits to the site in question
- Technical qualifications
  - Must use a screen reader

There is likelihood that these participants are affiliated with the VA, are not centrally located geographically, and are visually impaired. Therefore, these circumstances would encourage the following:

- Recruiting through the VA
- Testing remotely to eliminate the need for cost of travel
- Allowing participants to use their own equipment

LICENSES AND ATTRIBUTIONS

"User Testing" by Usability.gov (U.S. Dept. of Health and Human Services). The Research-Based Web Design & Usability Guidelines, Enlarged/Expanded edition. Washington: U.S. Government Printing Office, 2006. (Unless otherwise noted, text, documents, and images on the Usability.gov website are in the public domain, are not copyrighted, and therefore may be copied and distributed at no cost. https://www.usability.gov/about-us/index.html)

Reference: Observing the User Experience: A Practitioner's Guide for User Research by Mike Kuniavsky

4.4 WHY AND HOW DO YOU USE A TEAM CONTRACT?

THE PURPOSE OF A TEAM CONTRACT

A team contract is a document that describes a team's goals, norms, rewards, and sanctions. It is used to define group expectations and forces people to be explicit about their assumptions. It is created before the team starts to work on projects together and offers a framework for the discussion of disagreements within the team.

HOW TO CREATE A TEAM CONTRACT

- Use the following tips to create an effective group contract:
  Each team member writes down at least one point for each component

- Suggested points are shared for discussion

- Disagreements are resolved through discussion

  - Consensus is the goal, not majority rule

  - All team members should be heard

- The team decides which points to adopt

  - Each section must contain the minimum number of points listed

  - More points may be incorporated, but avoid creating too many rules

- The accepted points are written down as the team contract

- The contract can be changed later by mutual agreement if it does not function well for the team

- The contract is signed by all team members

COMPONENTS OF A TEAM CONTRACT

The following are the components of a team contract. They should be labeled as separate sections in your document.

- Goals: What your team hopes to achieve (minimum 1)

- Norms: Group belief about how members should behave in a given context

    - Meeting (minimum 2)

    - Working (minimum 2)

    - Coordination (minimum 2)

    - Communication (minimum 2)

    - Consideration (minimum 2)

    - Continuous Improvement (minimum 2)

- Rewards: How the team will celebrate achieving goals (minimum 1)

- Sanctions: How the team will address failure to abide by norms (minimum 1)

POINTS TO CONSIDER AND EXAMPLES

OBJECTIVES

- Learning objectives: "To ensure that all team members understand the course material"

- Interpersonal relationship objectives: "To foster an atmosphere of mutual respect and learning"

- Functional objectives: "To have efficient team meetings"

MEETING NORMS

- When will the team meet?

- Are meetings mandatory?

- Is being late acceptable?

WORKING NORMS

- How will decisions be made?
- How will team members give and receive criticism?
- How independently should we work?

COORDINATION NORMS

- Who will lead the team meetings?
- Who will allocate assignments?
- Who is responsible for keeping the meetings on track?

COMMUNICATION NORMS

- How will team members communicate outside of meetings?
- How quickly should a team member respond to a communication?
- Are all team communications public?
- How should a team member communicate an illness?

CONSIDERATION NORMS

- Are side conversations appropriate?
- How will we handle disagreement?

CONTINUOUS IMPROVEMENT NORMS

- How will we track the team's progress?
- How will we evaluate the work of others?
- Do certain outcomes trigger a discussion?

REWARDS

- How will we mark achievements?

SANCTIONS

- How will we respond to a team member failing to meet obligations?
- How will we respond to a team member violating group norms?

WRITE THE TEAM CONTRACT

1. Goals: What your team hopes to achieve

2. Norms: Group belief about how members should behave

      2.1 Meeting norms

      2.2 Working norms

      2.3 Coordination norms

      2.4 Communication norms

      2.5 Consideration norms

      2.6 Continuous Improvement norms

3. Rewards: How the team will celebrate achieving goals

4. Sanctions: How the team will address failure to abide norms

LICENSES AND ATTRIBUTIONS

"The Team Contract" by Open Source Research

4.5 WHAT DOES PEER REVIEW LOOK LIKE IN TECHNICAL COMMUNICATION?

Revising and editing are the two tasks you undertake to significantly improve your essay. Both are very important elements of the writing process. You may think that a completed first draft means little improvement is needed. However, even experienced writers need to improve their drafts and rely on peers during revising and editing. You may know that athletes miss catches, fumble balls, or overshoot goals. Dancers forget steps, turn too slowly, or miss beats. For both athletes and dancers, the more they practice, the stronger their performance will become. Web designers seek better images, a more clever design, or a more appealing background for their web pages. Writing has the same capacity to profit from improvement and revision. When you revise and edit, you take a second look at your ideas. You might add, cut, move, or change information in order to make your ideas clearer, more accurate, more interesting, or more convincing.

After working so closely with a piece of writing, writers often need to step back and ask for a more objective reader. When they are ready, writers show their drafts to someone they respect and who can give an honest response about its strengths and weaknesses. You, too, can ask a peer to read your draft when it is ready. After evaluating the feedback and assessing what is most helpful, the reader's feedback will help you when you revise your draft. This process is called peer review. You can work with a partner in your class and identify specific ways to strengthen each other's essays. Although you may be uncomfortable sharing your writing at first, remember that each writer is working toward the same goal: a final draft that fits the audience and the purpose. Maintaining a positive attitude when providing feedback will put you and your partner at ease.

The forms that follow provide possible frameworks for the peer review session:

FORM 1: QUESTIONS FOR PEER REVIEW

1. The audience for the document is

2. The purpose of the document is

3. What I most liked about this document is

4. These three features struck me as your strongest:

   A. Feature:

   B. Why:

   C. Feature:

   D. Why:

   E. Feature:

   F. Why:

5. These places in your document are not clear to me:

   A. Where:

   B. Needs improvement because:

   C. Where:

   D. Needs improvement because:

   E. Where:

   F. Needs improvement because:

6. The one additional change you could make that would improve this essay significantly is

FORM 2: PEER DRAFT REVIEW

Name of Draft Author:

Name of Draft Reviewer:

Author:

First, describe the style of feedback you would like to receive from your reviewer (e.g., be kind or be super critical). Then, identify at least three specific concerns you have about your draft and ask your reviewer for feedback (e.g., is my formatting consistent throughout the document).

Style of Feedback Preferred:

Concern 1:

Concern 2:

Concern 3:

Any additional concerns?

If your partner is not familiar with your project, make sure to give him or her a brief description.

Reviewer:

Read your partner's draft and answer the following questions. If appropriate, you can include your feedback on your partner's draft.

1. Review your partner's concerns. Provide feedback. Focus on being specific and detailed in your responses.

   Concern 1:

   Concern 2:

   Concern 3:

2. Are there any places where the author's writing is unclear, vague or could use additional detail? If so, identify and suggest a way of making the writing more clear and concrete.

3. Any additional concerns?

4. Are there any places where the author's writing can be more concise? If so, identify and suggest a way of making the writing more concise.

5. Be charitable and describe something the draft does well.

6. Be critical and describe something that the author could improve.

7. Include any other impressions or comments about this piece of writing.

LICENSES AND ATTRIBUTIONS

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CHAPTER 5

RESEARCH AND STYLE GUIDES

5.1 HOW DO YOU TRUST SOURCES IN TECHNICAL COMMUNICATION?

INTRODUCTION TO THE INFORMATION LITERACY USER'S GUIDE

You may be using this information for any one of a variety of reasons. It may have been assigned by a professor, in whole or in part. You may be using it to enhance your research techniques for your classes. Or you may see the importance of being savvy about information use and production, and have decided to learn more on your own. After all, our world is defined by our easy access to information. In fact, as is often said, we are drowning in information. Some is valuable. Some is worthless. And some is just fun, in its proper context.

As you know, information comes in many different formats and sometimes, depending on the content, information in one format can be in any of these categories. For example, a tweet could be valuable (maybe an expert on a topic has just announced something groundbreaking), worthless ("Going shopping. Looking for socks that don't fall down."), or fun (I'll let you decide what that message might be). So it seems that information content, context, and quality matter more than what kind of package or format the information takes. And accessing information is just one component; there is also your role as an information producer.

So let's start at the beginning. If you are information literate, you are adept at working with information. But a user's guide can still be of assistance, since there are so many components to information. You, the authors, and just about everyone is better versed in working with some aspects of information than with others. While you will find elements in this book that you are totally up to speed on, there will be others that you have less familiarity with. Hence, the value of a user's guide.

There are a variety of different models and subsets of information literacy: visual literacy, science literacy, digital literacy, information fluency, media literacy, and many more. Let's highlight just one: metaliteracy. The originators of this model think of metaliteracy as information literacy for today's open, networked, collaborative information environment. Metaliteracy also places an emphasis on metacognition, or thinking about your own thinking. Being able to find and use information well means realizing what you know, what you don't, and what you need to learn, and thinking about these categories throughout the process. It means being aware of how one is interacting with information, and not just reverting to long-standing habits only because they are familiar.

You might think of the learning objectives as one of those headlines you see on magazine covers while waiting in a grocery store checkout lane:

- 6 Symptoms You Shouldn't Ignore (from AARP, January/February 2013)

- 50 People Who Make Your Life Better (from AARP, January/February 2013)

- Get 30% Richer This Year: Very Smart Money Tips (from Marie Claire, February 2013)

- 4 Panza-Blasting Moves for a Tighter Bod (from Cosmopolitan, Spring 2013)

Maybe there should be some catchy, motivational title for these learning objectives. But, in seriousness, being aware of your own thought processes and working towards becoming more proficient in the areas included in the metaliteracy learning objectives will help you in your academic endeavors and in your everyday life. Are there items that you do well? Are there others that you just need to remember to follow through on? Possibly some will be less familiar to you. Recognize that they are empowering behaviors and attributes that will advance your abilities in school, the workplace, and in daily life.

Here is the SCONUL Seven Pillars of Information Literacy. The model was developed in the United Kingdom, and revised in 2011 to reflect today's information world. As you would expect, its visual representation shows pillars, each one labeled with a one-word access point to a larger concept. The pillars, with short explanatory descriptions, are the following:

- **Identify** (understanding your information need)

- **Scope** (knowing what is available)

- **Plan** (developing research strategies)

- **Gather** (finding what you need)

- **Evaluate** (assessing your research process and findings)

- **Manage** (organizing information effectively and ethically)
- **Present** (sharing what you've learned)

The developers of the Seven Pillars model explain that an individual can be more expert in some areas than others, and has the ability to increase their expertise. But interestingly, the developers also mention that people can become less expert in the areas designated by the pillars. How might that be? If you learned something, and then learned more, you become more adept, right? They make the point, however, that because the information environment shifts all the time, it is possible people won't keep up, and thus will become less proficient. So just as someone can climb one of the pillars, so too can they slip down.

Each of the seven areas incorporates both abilities and understandings. The abilities include what an individual can do. The understandings cover both attitude and behaviors. For example, someone might be aware that they should carefully evaluate the information they find and know how to go about it, yet not care enough to actually do it. Abilities and understandings work together to enable information literacy.

This introduction is intended to be short, and will end with an important recommendation: remember to reflect on your new knowledge, skills, and attitudes. What are you doing differently? Did you find particular new approaches to locating or sharing information that work better? Why? Are you evaluating information more consistently? Differently? Do you feel more comfortable as an information producer? If you continue to ask yourself questions like these, and follow through based on your responses, your proficiency with information will last far beyond your memory of reading this textbook.

IDENTIFY: UNDERSTANDING YOUR INFORMATION NEED

In this section, you will learn about the first pillar of information literacy. While the pillars are normally presented in a certain order, they are not intended to be a step-by-step guide to be followed in a strict order. In most research projects, you will find that you move back and forth between the different pillars as you discover more information and come up with more questions about your topic. Here, you will learn how to identify your information need so that you can begin your research, but it is likely that you will also revisit some of the ideas to make sure you are actually meeting that need with your research findings.

A person proficient in the Identify pillar is expected to be able to identify a personal need for information. They understand the following:

- That new information and data is constantly being produced and that there is always more to learn

- That being information literate involves developing a learning habit so new information is being actively sought all the time

- That ideas and opportunities are created by investigating/ seeking information

- That the scale of the world of published and unpublished information and data needs to be considered

They are able to

- Identify a lack of knowledge in a subject area

- Identify a search topic/question and define it using simple terminology

- Articulate current knowledge on a topic

- Recognize a need for information and data to achieve a specific end and define limits to the information need

- Use background information to underpin the search

- Take personal responsibility for an information search

- Manage time effectively to complete a search

Figure 22: Proficiencies in the Identify pillar
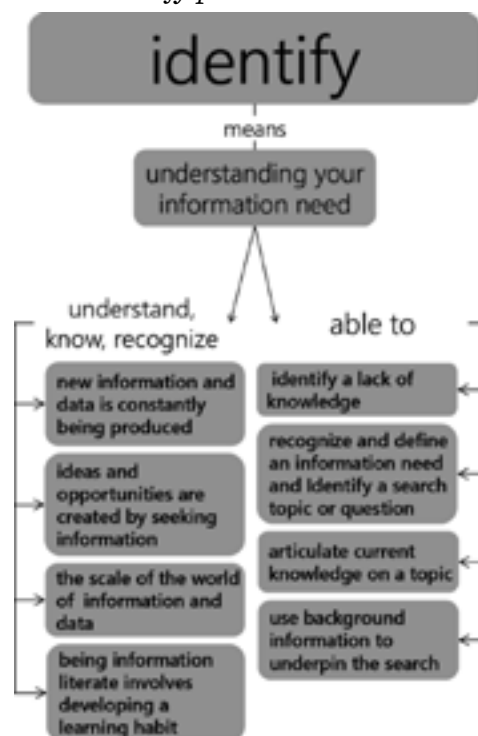
SCENARIO

Norm Allknow was having trouble. He had been using computers since he was five years old and thought he knew all there was to know about them. So, when he was given an assignment to write about the impact of the Internet on society, he thought it would be a breeze. He would just write what he knew, and in no time the paper would be finished. In fact, Norm thought the paper would probably be much longer than the required ten pages. He spent a few minutes imagining how impressed his teacher was going to be, and then sat down to start writing.

He wrote about how the Internet had helped him to play online games with his friends, and to keep in touch with distant relatives, and even to do some homework once in awhile. Soon he leaned back in his chair and looked over what he had written. It was just half a page long and he was out of ideas.

IDENTIFYING A PERSONAL NEED FOR INFORMATION

One of the first things you need to do when beginning any information-based project is to identify your personal need for information. This identification may seem obvious, but it is something many of us take for granted. We may mistakenly assume, as Norm did in the above example, that we already know enough to proceed. Such an assumption can lead us to waste valuable time working with incomplete or outdated information. Information literacy addresses a number of abilities and concepts that can help us to determine exactly what our information needs are in various circumstances. These are discussed below, and are followed by exercises to help develop your fluency in this area.

UNDERSTANDING THE CONTEXT OF AN INFORMATION NEED

When you realize that you have an information need, it may be because you thought you knew more than you actually do, or it may be that there is simply new information you were not aware of. One of the most important things you can do when starting to research a topic is to scan the existing information landscape to find out what is already out there. It pays to think more broadly about the information environment in which you are operating.

For instance, any topic you need information about is constantly evolving as new information is added to what is known about the topic. Trained experts, informed amateurs, and opinionated laypeople are publishing in traditional and emerging formats; there is always something new to find out. The scale of information available varies according to topic, but in general it's safe to say that there is more information accessible now than ever before.

Due to the extensive amount of information available, part of becoming more information literate is developing habits of mind and of practice that enable you to continually seek new information and to adapt your understanding of topics according to what you find. Because of the widely varying quality of new information, evaluation is also a key element of information literacy.

Finally, while you are busy searching for information on your current topic, be sure to keep your mind open for new avenues or angles of research that you haven't yet considered. Often the information you found for your initial need will turn out to be the pathway to a rich vein of information that can serve as raw material for many subsequent projects.

When you understand the information environment where your information need is situated, you can begin to define the topic more clearly and you can begin to understand where your research fits in with related work that precedes it. Your information literacy skills will develop against this changing background as you use the same underlying principles to do research on a variety of topics.

FROM INFORMATION NEED TO RESEARCH QUESTION

Norm was abruptly confronted by his lack of knowledge when he realized that he had nothing left to say on this topic after writing half a page. Now that he is aware of that shortcoming, he can take steps to rectify it.

Your own lack of knowledge may become apparent in other ways. When reading an article or textbook, you may notice that something the author refers to is completely new to you. You might realize while out walking that you can't identify any of the trees around your house. You may be assigned a topic you have never heard of.

EXERCISE: IDENTIFYING WHAT YOU DON'T KNOW

1. Wherever you are, look around you. Find one thing in your immediate field of view that you can't explain.

2. What is it that you don't understand about that thing?

3. What is it that you need to find out so that you can understand it?

4. How can you express what you need to find out?

For example: You can't explain why your coat repels water. You know that it's plastic, and that it's designed to repel water, but can't explain why this happens. You need to find out what kind of plastic the coat is made of and the chemistry or physics of that plastic and of water that makes the water run off instead of soaking through. (The terminology in your first explanation would get more specific once you did some research.)

All of us lack knowledge in countless areas, but this isn't a bad thing. Once we step back and acknowledge that we don't know something, it opens up the possibility that we can find out all sorts of interesting things, and that's when the searching begins.

Taking your lack of knowledge and turning it into a search topic or research question starts with being able to state what your lack of knowledge is. Part of this process is to state what you already know. It's rare that you'll start a search from absolute zero. Most of the time you've at least heard something about the topic, even if it is just a brief reference in a lecture or reading. Taking stock of what you already know can help you to identify any erroneous assumptions you might be making based on incomplete or biased information. If you think you know something, make sure you find at least a couple of reliable sources to confirm that knowledge before taking it for granted. Use the following exercise to see if there is anything that needs to be supported with background research before proceeding.

EXERCISE: TAKING STOCK OF WHAT YOU ALREADY KNOW

As discussed above, part of identifying your own information need is giving yourself credit for what you already know about your topic. Construct a chart using the following format to list whatever you already know about the topic. An example of this chart can be seen in Figure 23.

1. Name your topic at the top.

2. In the first column, list what you know about your topic.

3. In the second column, briefly explain how you know this information (heard it from the professor, read it in the textbook, saw it on a blog, etc.).

4. In the last column, rate your confidence in that knowledge. Are you 100% sure of this bit of knowledge, or did you just hear it somewhere and assume it was right?

When you've looked at everything you think you know about the topic and why, step back and look at the chart as a whole. How much do you know about the topic, and how confident are you about it? You may be surprised at how little or how much you already know, but either way you will be aware of your own background on the topic. This self-awareness is key to becoming more information literate.

This exercise gives you a simple way to gauge your starting point and may help you identify specific gaps in your knowledge of your topic that you will need to fill as you proceed with your research. It can also be useful to revisit the chart as you work on your project to see how far you've progressed, as well as to double check that you haven't forgotten an area of weakness.

Figure 23: An example of a chart to track what you know

What do you know?	How do you know it?	How confident are you in this knowledge?

Once you've clearly stated what you do know, it should be easier to state what you don't know. Keep in mind that you are not attempting to state everything you don't know. You are only stating what you don't know in terms of your current information need. This step is where you define the limits of what you are searching for. These limits enable you to meet both size requirements and time deadlines for a project. If you state them clearly, they can help to keep you on track as you proceed with your research.

One useful way to keep your research on track is with a "KWHL" chart (Figure 24). This type of chart enables you to state both what you know and what you want to know, as well as providing space where you can track your planning, searching and evaluation progress. For now, just fill out the first column, but start thinking about the gaps in your knowledge and how they might inform your research questions. You will learn more about developing these questions and the research activities that follow from them as you work through this book.

Figure 24: A KWHL Chart

What do you already Know about your topic?	What do you Want to know about your topic?	How will you find information on your topic?	What have you Learned about your topic?

Defining a research question can be more difficult than it seems. Your initial questions may be too broad or too narrow. You may not be familiar with specialized terminology used in the field you are researching. You may not know if your question is worth investigating at all.

These problems can often be solved by a preliminary investigation of existing published information on the topic. As previously discussed, gaining a general understanding of the information environment helps you to situate your information need in the relevant context and can also make you aware of possible alternative directions for your research. On a more practical note, however, reading through some of the existing information can also provide you with commonly used terminology, which you can then use to state your own research question, as well as in searches for additional information. Don't try to reinvent the wheel, but rely on the experts who have laid the groundwork for you to build upon.

Once you have identified your own lack of knowledge, investigated the existing information on the topic, and set some limits on your research based on your current information need, write out your research question or state your thesis. The next exercise will help you transform the question you have into an actual thesis statement. You'll find that it's not uncommon to revise your question or thesis statement several times in the course of a research project. As you become more and more knowledgeable about the topic, you will be able to state your ideas more clearly and precisely, until they almost perfectly reflect the information you have found.

EXERCISE: RESEARCH QUESTION/THESIS STATEMENT/SEARCH TERMS

Since this section is all about determining and expressing your information need, let's follow up on thinking about that with a practical exercise. Follow these steps to get a better grasp of exactly what you are trying to find out, and to identify some initial search terms to get you started:

1. Whatever project you are currently working on, there should be some question you are trying to answer. Write your current version of that question here.

2. Now write your proposed answer to your question. This may be the first draft of your thesis statement which you will attempt to support with your research, or in some cases, the first draft of a hypothesis that you will go on to test experimentally. Your thesis doesn't have to be perfect at this point, but based on your current understanding of your topic and what you expect or hope to find is the answer to the question you asked.

3. Look at your question and your thesis/hypothesis, and make a list of the terms common to both lists (excluding "the," "and," "a," etc.). These common terms are likely the important concepts that you will need to research to support your thesis/hypothesis. They may be the most useful search terms overall or they may only be a starting point.

If none of the terms from your question and thesis/hypothesis lists overlap at all, you might want to take a closer look and see if your thesis/hypothesis really answers your research question. If not, you may have arrived at your first opportunity for revision. Does your question really ask what you're trying to find out? Does your proposed answer really answer that question? You may find that you need to change one or both, or to add something to one or both to really get at what you're interested in. This is part of the process, and you will likely discover that as you gather more information about your topic, you will find other ways that you want to change your question or thesis to align with the facts, even if they are different from what you hoped.

A WIDER VIEW

While the identification of an information need is presented in this section as the first step in the research process, many times the information need you initially identified will change as you discover new information and connections. Other sections of this book deal with finding, evaluating, and managing information in a variety of ways and formats. As you become more skilled in using different information resources, you will likely find that the line between the various information literacy skills becomes increasingly blurred, and that you will revisit your initial ideas about your topic in response to both the information you're finding and what you're doing with what that information.

Continually think about your relationship to the information you find. Why are you doing things the way you are? Is it really the best way for your current situation? What other options are there? Keeping an open mind about your use of information will help you to ensure that you take responsibility for the results of that use, and will help you to be more successful in any information-intensive endeavor.

LICENSES AND ATTRIBUTIONS

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5.2 WHAT ARE SOME MISCONCEPTIONS ABOUT RESEARCH?

DEMYSTIFYING RESEARCH METHODS

If you are like most people, you have some definite ideas about what research is. You may envision a pale figure in a white lab coat bent over a microscope or a beaker of bubbling liquid. Perhaps you imagine this isolated and humorless figure engaged in tedious procedures, carefully recorded on graph paper or reduced to inscrutable formulas scrawled in notebooks. Given a few moments, you might expand this vision of research to include a khaki-clad archaeologist digging for relics in the desert or a tweed-jacketed professor studying musty manuscripts in a dusty corner of the library.

These visions of imaginary researchers probably seem disconnected from your personal experience with research. Your first encounter with the term "research" may have been in the form of an English class assignment that required you to write a paper of a specified number of words in which you referenced a minimum number of sources using correct bibliographic citations. You may have spent a few uncomfortable hours in the library searching for material that had some bearing on the topic of your paper, then tried to collect bits and pieces from these sources into a more-or-less coherent whole without committing an obvious act of plagiarism. As you struggled with the apparently contradictory requirements to base your paper on the work of others but say something new, you probably wondered what this assignment had to do with "research."

FIVE MISCONCEPTIONS ABOUT RESEARCH

None of these visions accurately represent the research process. Most people have a distorted picture of what researchers do. They tend to view research

as tedious, repetitious, dull, and irrelevant to most of our immediate practical concerns. In fact, research should be the opposite. In order to envision research as interesting, exciting, and fun, you may need to dispel some common misconceptions about where research is done, who does it, and what it entails.

- **Misconception #1:** Research is conducted in a laboratory.

- **Misconception #2:** Research is for eggheads.

- **Misconception #3:** Research has little to do with everyday life.

- **Misconception #4:** Researchers across disciplines agree about what constitutes effective research.

- **Misconception #5:** Researchers think, research, and then write.

MISCONCEPTION #1: RESEARCH IS CONDUCTED IN A LABORATORY

Whether we realize it or not, most of us have acquired our understanding of research from the images presented by popular culture. Mary Shelley's Frankenstein, for example, has provided one of the most dramatic and enduring representations of laboratory research. Contemporary films like Outbreak suggest an updated version of the researcher, still white-coated but now isolated from normal social contact by the need for extraordinary anti contamination precautions. Perhaps because it is unfamiliar and, therefore, potentially dangerous, the laboratory offers a more dramatic setting for fictional accounts than other, more accessible research environments.

Of course, some kinds of research require the controlled environments that laboratories provide. The medical research that developed the antibiotics and pain relievers your doctor prescribed that last time you had the flu was conducted in a laboratory. And most of the commercially produced consumer products you use every day–from paint to cereal to hand lotion–undergo testing and refining in some sort of laboratory. But laboratory research is only one particular kind of research.

In reality, research is conducted everywhere. You may have noticed an amiable young person with a clipboard stopping shoppers in the local mall to ask questions about their buying preferences. That person was conducting research. The best-selling account of Lewis and Clark's explorations is the result of research, as is the Thursday night lineup of your favorite TV shows, the design of your computer desk, the pattern of the traffic flow through your neighborhood, and the location of the nearest restaurant. None of the research that produced these results was conducted in a laboratory.

If, for example, you are interested in investigating how people behave in natural situations and under normal conditions, you cannot expect to gather information in a laboratory. In other words, the questions researchers are trying to answer and the methods they select for answering these questions will determine where the research is conducted. Research is carried out wherever researchers must go to collect the information they need.

MISCONCEPTION #2: RESEARCH IS FOR EGGHEADS

Just as images from popular culture have influenced our ideas about where research is conducted, pop culture has also created some persistent stereotypes of researchers. In addition to the rather demonic Dr. Frankenstein, you may also think of friendlier, if slightly addled eggheads like the professor on Gilligan's Island, the Jerry Lewis or Eddie Murphy version of The Nutty Professor, or the laughable Disney character, Professor Ludwig von Drake. These images all reinforce the notion of researchers as absent minded eccentrics, engrossed in highly technical, specialized projects that most of us cannot understand.

However, just as research can be carried out almost anywhere, anyone can be a researcher. Asking questions about your friend's new romance, gathering evidence of who she was seen with, making deductions based on her new style of dress, and spreading the word about your conclusions is a form of research. These activities don't sound like research to most people because they have not been expressed in academic language. But what if the activities were organized into a research project titled "The Psychosocial Determinants of Gender Relations in Postmodern Dating Culture: A Psychoanalytic Approach"? The point, of course, is not to suggest that gossip qualifies as legitimate research but rather that everyone employs the investigative and exploitative elements of research to make sense of their lives. Research is not just for "eggheads."

MISCONCEPTION #3: RESEARCH HAS LITTLE TO DO WITH EVERYDAY LIFE

While the first two misconceptions concern where research is done and who does it, the third misconception misrepresents the subject matter of research. Because some research focuses on very narrow questions and relies on highly technical knowledge, people often assume that all research must be hard to understand and unrelated to everyday concerns.

However, research need not be difficult to understand, and research is an activity that is defined by its method, not by its subject. In other words, it is true that some significant research is difficult for non-specialists to understand. Yet all research is valuable to the extent that it affects everyday life.

Research takes many forms, but it always entails a search, conducted carefully and diligently, aimed at the discovery and interpretation of new knowledge. Thus, how you go about gathering information, analyzing data, drawing conclusions, and sharing results determines whether your activities qualify as research. Sometimes these activities will be informal, spontaneous, and intuitive, as when you infer that your friend has a new romance or when you read reviews in a computer magazine before purchasing new software. In school and in the workplace, where results are disseminated and evaluated by others, research is likely to be more formal. Regardless of its final form, however, whenever you systematically gather information for the purpose of generating new knowledge, you are conducting research.

MISCONCEPTION #4: RESEARCHERS ACROSS DISCIPLINES AGREE ABOUT WHAT CONSTITUTES EFFECTIVE RESEARCH

Academic disciplines—for example, mathematics, psychology, physics, engineering, or business—have different ways of conducting and evaluating research. An anthropologist's account of kinship patterns in a tribe of Native Americans bears almost no resemblance to a cognitive psychologist's investigation of sensory responses to light stimuli. Even within a particular academic discipline, researchers may disagree over what makes good research.

Not only do people disagree about appropriate methods of research, but their ideas may change over time. Conceptions about knowledge, available technologies, and research practices influence each other and change constantly. For example, capturing gorillas and studying them in cages might have been considered good research in the 1920s. The work of later researchers like Dian Fossey, however, demonstrated how animals might be better understood in their natural environment. Today, research based on observations of wild animals in captivity would gain little support or interest.

Because no one way of doing research is equally acceptable to all researchers in all academic disciplines, researchers must select the methodology that will be most persuasive to their readers.

MISCONCEPTION #5: RESEARCHERS THINK, RESEARCH, AND THEN WRITE

When you first begin a research project, you are wise to integrate writing activities with research activities. Unfortunately, many people wrongly separate the research process from the writing process. They naively assume they should first think about a topic, identify a research question, research it, and then—after all of the excitement is drained from the project—write it up. Rather than using the generative power of writing (that is, our ability to generate new ideas by writing) to help define and energize a research project, some people delay writing until after they have completed the research. Waiting to write about a research project until you're done researching may waste your time and can result in dull, listless prose.

You can save time and ensure that your research is focused by writing summaries of others' research, by writing drafts of your research goals, and by writing about the results you hope to find before you find them. In the process, you will eliminate vague or contradictory ideas you may have about your project.

Incorporating writing into your research activities helps you identify your rhetorical situation and define your readers' priorities. Writing about your project in its early stages gives you time to develop ways of describing your research that are comprehensible and interesting to your audience. As you redraft and revise, your writing—and your thinking—will become clearer, more precise, and thus more credible.

We can all take a lesson in the importance of making your research your own from Gary Starkweather, who built a laser printer that made billions of dollars for Xerox and helped change the way business is done all over the world. The experience taught him several things:

It's better to try and fail than to decide something can't be done and not try at all. Research is a place where failure should be, if not encouraged, at least viewed as a sign that something's happening. Uncertainty is bad for manufacturing, but essential for research.

Believe in your own ideas and don't trim your sails just to be popular with your colleagues. Howard Aiken, inventor of the first digital computer, said: "If it's truly a good idea, you'll have to jam it down their throats."

Be open to suggestion. Often someone who hasn't stared at a problem until they went cross-eyed has the fresh view that can solve it. The best way to a breakthrough is constant small improvement — those waiting for the big break are just lazy; they're waiting to be teleported to the top of the hill instead of walking.

YOU MIGHT WANT TO TRY SOME OF THE FOLLOWING:

In a couple of paragraphs describe a research project or a paper you have written in the past that you felt was interesting, fun, or successful. Try to identify what made the project appealing. Why did it spark your interest? Did you develop the idea yourself, did someone help you, or was it assigned? How did your readers respond to your work? Why do you think they acted that way? Do you feel it might be worthwhile to build on the work you completed earlier by digging deeper into the subject? In what ways did your attitude influence the way you conducted and wrote your research? How can you take advantage of your experience in order to enjoy future projects? What additional misconceptions about research can you identify?

To develop a better understanding of the research process, maintain a journal of your activities and thoughts while you conduct a research project.

LICENSES AND ATTRIBUTIONS

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5.3 HOW DO YOU AVOID PLAGIARISM?

"The ease of saving images off of the web has caused a very real problem for artists and content providers alike. If you have placed your intellectual property on the web chances are that sooner or later someone is going to 'borrow' a little bit of it... without your permission." —Linda Cole

INTELLECTUAL PROPERTY

In order to avoid inadvertent plagiarism or academic dishonesty, you must understand intellectual property and copyright. In our digital age, where users can easily download information, we must consider these issues from an ethical perspective as well.

Intellectual Property (IP) refers to a document or ideas owned by authors, publishers, and corporations. IP is anything that reflects an original thought that is written down or expressed in any media, such as word-processed documents, emails, Web sites, and music. Simply put, what you create is your "intellectual property." Graphics, songs, poems, pictures, and essays are examples of "properties" that are owned by their creators, properties that are subject to U.S. and international copyright laws.

INTELLECTUAL PROPERTY RESOURCES

COPYRIGHT

Copyright refers to the laws that protect your ownership of property (whether or not you file a formal copyright application). Plagiarism refers to the theft of someone's intellectual property. According to the U.S. Copyright Office, Copyright is a form of protection provided by the laws of the United States

(title 17, U.S.Code) to the authors of "original works of authorship" including literary, dramatic, musical, artistic, and certain other intellectual works (U.S. Copyright Office, Copyright Basics, Circular 1).

Copyright refers to the laws that protect the creator's intellectual property. Copyright laws allow you (as the creator) certain rights. With Copyright, you can do the following:

1. Reproduce the work in copies such as books or CDs.

2. Prepare a derivative work. For example, if you write a book or short story, only you can create a play or movie from that story. (Of course, you can sell these rights if you so desire.)

3. Distribute copies of your work to the public by sales or other methods. You get to perform or display the work publicly (e.g., plays, music, or dance performances).

COPYRIGHT RESOURCES

- iCopyright: "Our goal is to put the iCopyright icon on every Web page— and give it intelligence. It will "know" about the content it sits on. It will help publishers protect, license, and track their intellectual property. It will give credit to the people who created it. It will help Internet users obtain the proper license to reprint or reuse copyrighted works in the format they desire."

- Privacy in the Online Classroom: Article that explores reasons to limit access and restriction methods

- Chilling Effects Clearinghouse: Written by students at UC Berkeley's Boalt Hall School of Law, "These pages will help you understand the protections intellectual property laws and the First Amendment give to your online activities. We are excited about the new opportunities the Internet offers individuals to express their views, parody politicians, celebrate their favorite movie stars, or criticize businesses."

- Copyright: Intellectual Property in the Information Age: A Classroom Guide to Copyright from Janice Walker, University of South Florida, Dept. of English.

- Intellectual Property Law: This site "provides information about intellectual property law including patent, trademark and copyright. Resources include comprehensive links, general information, space for professionals to publish articles and forums for discussing related issues."

- Gigalaw.com: Excellent resource for information on intellectual property and copyright.

- Copyright Myths: Wonderful, easy-to-understand, rich essay on copyright. If you're going to read just one essay on copyright, read this one!

AVOIDING PLAGIARISM: OVERVIEW AND CONTRADICTIONS

WELCOME TO THE PURDUE OWL

There are few intellectual offenses more serious than plagiarism in academic and professional contexts. This resource offers advice on how to avoid plagiarism in your work.

Contributers: *Karl Strolley, Allen Brizee, Joshua M. Paiz*

Research-based writing in American institutions, both educational and corporate, is filled with rules that writers, particularly beginners, aren't aware of or don't know how to follow. Many of these rules have to do with research and proper citation. Gaining familiarity with these rules, however, is critically important, as inadvertent mistakes can lead to charges of **plagiarism**, which is the uncredited use (both intentional and unintentional) of somebody else's words or ideas.

While some rhetorical traditions may not insist so heavily on documenting sources of words, ideas, images, sounds, etc., American academic rhetorical tradition does. A charge of plagiarism can have severe consequences, including expulsion from a university or loss of a job, not to mention a writer's loss of credibility and professional standing. This resource, which does not reflect any official university policy, is designed to help you develop strategies for knowing how to avoid accidental plagiarism. For instructors seeking a key statement on definitions and avoidance on plagiarism, see Defining and Avoiding Plagiarism: The WPA Statement on Best Practices.

(Purdue University students will want to make sure that they are familiar with Purdue's official academic dishonesty policy as well as any additional policies that their instructors have implemented.)

INTELLECTUAL CHALLENGES IN AMERICAN ACADEMIC WRITING

There are some intellectual challenges that all students are faced with when writing. Sometimes these challenges can almost seem like contradictions, particularly when addressing them within a single paper. For example, American teachers often instruct students to:

Develop a topic based on what has already been said and written

BUT

Write something new and original

Rely on experts' and authorities' opinions

BUT

Improve upon and/or disagree with those same opinions

Give credit to previous researchers

BUT

Make your own significant contribution

Improve your English to fit into a discourse community by building upon what you hear and read

BUT

Use your own words and your own voice

For instructor and student documents on preventing plagiarism, please visit these resources on the Purdue OWL.

IS IT PLAGARISM YET?

There are some actions that can almost unquestionably be labeled plagiarism. Some of these include **buying, stealing, or borrowing a paper** (including, of course, copying an entire paper or article from the Web); **hiring someone to write your paper** for you; and **copying large sections of text** from a source without quotation marks or proper citation.

But then there are actions that are usually in more of a gray area. Some of these include using the words of a source too closely when paraphrasing (where quotation marks should have been used) or building on someone's

ideas without citing their spoken or written work. Sometimes teachers suspecting students of plagiarism will consider the students' intent, and whether it appeared the student was deliberately trying to make ideas of others appear to be his or her own.

However, other teachers and administrators may not distinguish between deliberate and accidental plagiarism. So let's look at some strategies for avoiding even suspicion of plagiarism in the first place.

WHEN DO WE GIVE CREDIT?

The key to avoiding plagiarism is to make sure you give credit where it is due. This may be credit for something somebody said, wrote, emailed, drew, or implied. Many professional organizations, including the Modern Language Association (MLA) and the American Psychological Association (APA), have lengthy guidelines for citing sources. However, students are often so busy trying to learn the rules of MLA format and style or APA format and style that they sometimes forget exactly what needs to be credited. Here, then, is **a brief list of what needs to be credited or documented**:

- Words or ideas presented in a magazine, book, newspaper, song, TV program, movie, Web page, computer program, letter, advertisement, or any other medium

- Information you gain through interviewing or conversing with another person, face to face, over the phone, or in writing

- When you copy the exact words or a unique phrase

- When you are using "common knowledge," things like folklore, common sense observations, myths, urban legends, and historical events (but not historical documents)

- When you are using generally-accepted facts, e.g., pollution is bad for the environment, including facts that are accepted within particular discourse communities, e.g., in the field of composition studies, "writing is a process" is a generally-accepted fact.

DECIDING IF SOMETHING IS "COMMON KNOWLEDGE"

Generally speaking, you can regard something as common knowledge if you find the same information undocumented in at least five credible sources. Additionally, it might be common knowledge if you think the information you're presenting is something your readers will already know, or something that a person could easily find in general reference sources. But when in doubt, cite; if the citation turns out to be unnecessary, your teacher or editor will tell you.

SAFE PRACTICES

Most students, of course, don't intend to plagiarize. In fact, most realize that citing sources actually builds their credibility for an audience and even helps writers to better grasp information relevant to a topic or course of study. Mistakes in citation and crediting can still happen, so here are certain practices that can help you not only avoid plagiarism, but even improve the efficiency and organization of your research and writing.

BEST PRACTICES FOR RESEARCH AND DRAFTING

READING AND NOTE-TAKING

- In your notes, always mark someone else's words with a big **Q**, for quote, or use big quotation marks

- Indicate in your notes which ideas are taken from sources with a big **S**, and which are your own insights (**ME**)

- When information comes from sources, record relevant documentation in your notes (book and article titles; URLs on the Web)

INTERVIEWING AND CONVERSING

- Take lots of thorough notes; if you have any of your own thoughts as you're interviewing, mark them clearly

- If your subject will allow you to record the conversation or interview (and you have proper clearance to do so through an Institutional Review Board, or IRB), place your recording device in an optimal location between you and the speaker so you can hear clearly when you review the recordings. Test your equipment, and bring plenty of backup batteries and media.

- If you're interviewing via email, retain copies of the interview subject's emails as well as the ones you send in reply

- Make any additional, clarifying notes immediately after the interview has concluded

WRITING PARAPHRASES OR SUMMARIES

- Use a statement that credits the source somewhere in the paraphrase or summary, e.g., According to Jonathan Kozol, ...).

- If you're having trouble summarizing, try writing your paraphrase or summary of a text without looking at the original, relying only on your memory and notes

- Check your paraphrase or summary against the original text; correct any errors in content accuracy, and be sure to use quotation marks to set off any exact phrases from the original text

- Check your paraphrase or summary against sentence and paragraph structure, as copying those is also considered plagiarism.

- Put quotation marks around any unique words or phrases that you cannot or do not want to change: e.g., "savage inequalities" exist throughout our educational system (Kozol).

WRITING DIRECT QUOTES

- Keep the source author's name in the same sentence as the quote

- Mark the quote with quotation marks, or set it off from your text in its own block, per the style guide your paper follows

- Quote no more material than is necessary; if a short phrase from a source will suffice, don't quote an entire paragraph

- To shorten quotes by removing extra information, use ellipsis points (...) to indicate omitted text, keeping in mind that:

  - In longer quotes where you have omitted a sentence in between other complete sentences, maintain terminal puncutation in between the ellipses.

  - **Example:** "None of the national reports I saw made even passing references to inequality or segregation. . . . Booker T. Washington was cited with increasing frequency, Du Bois never, and Martin Luther King only with cautious selectivity." (Kozol 3).

- To give context to a quote or otherwise add wording to it, place added words in brackets, ([]); be careful not to editorialize or make any additions that skew the original meaning of the quote—do that in your main text, e.g.,

  - **OK:** Kozol claims there are "savage inequalities" in our educational system, which is obvious.

  - **WRONG:** Kozol claims there are "[obvious] savage inequalities" in our educational system.

- Use quotes that will have the most rhetorical, argumentative impact in your paper; too many direct quotes from sources may weaken your credibility, as though you have nothing to say yourself, and will certainly interfere with your style

WRITING ABOUT ANOTHER'S IDEAS

- Note the name of the idea's originator in the sentence or throughout a paragraph about the idea

- Use parenthetical citations, footnotes, or endnotes to refer readers to additional sources about the idea, as necessary

- Be sure to use quotation marks around key phrases or words that the idea's originator used to describe the idea

MAINTAINING DRAFTS OF YOUR PAPER

Sometimes innocent, hard-working students are accused of plagiarism because a dishonest student steals their work. This can happen in all kinds of ways, from a roommate copying files off of your computer, to someone finding files on a disk or on a pen drive left in a computer lab. Here are some practices to keep your own intellectual property safe:

- Do not save your paper in the same file over and over again; use a numbering system and the Save As... function; E.g., you might have research_paper001.doc, research_paper002.doc, research_paper003.doc as you progress. Do the same thing for any HTML files you're writing for the Web. Having multiple draft versions may help prove that the work is yours (assuming you are being ethical in how you cite ideas in your work!).

- Maintain copies of your drafts in numerous media, and different secure locations when possible; don't just rely on your hard drive, pen drive, or the cloud.

- Password-protect your computer; if you have to leave a computer lab for a quick bathroom break, hold down the Windows key and L to lock your computer without logging out.

- Password-protect your files; this is possible in all sorts of programs, from Adobe Acrobat to Microsoft word (just be sure not to forget the password!).

REVISING, PROOFREADING, AND FINALIZING YOUR PAPER

- Proofread and cross-check with your notes and sources to make sure that anything coming from an outside source is acknowledged in some combination of the following ways:

  - In-text citation, otherwise known as parenthetical citation

  - Footnotes or endnotes

  - Bibliography, References, or Works Cited pages

- Quotation marks around short quotes; longer quotes set off by themselves, as prescribed by a research and citation style guide

- Indirect quotations: citing a source that cites another source

- If you have any questions about citation, ask your instructor **well in advance** of your paper's due date, so if you have to make any adjustments to your citations, you have the time to do them well

Works Cited

Kozol, Jonathan. *Savage Inequalities: Children in America's Schools*. New York: Crown Publishers, Inc., 1992. Print.

SAFE PRACTICES: AN EXERCISE

Read over each of the following passages, and respond on your own or as a class as to whether or not it uses citations accurately. If it doesn't, what would you do to improve the passage so it's properly cited?

1. Last summer, my family and I traveled to Chicago, which was quite different from the rural area I grew up in. We saw the dinosaur Sue at the Field Museum, and ate pizza at Gino's East.

2. Americans want to create a more perfect union; they also want to establish justice, ensure domestic tranquility, provide for the common defense, promote the general welfare, and secure the blessings of liberty for everybody.

3. I find it ridiculous that 57% of high school students think their teachers assign too much homework.

Numbers 4, 5, and 6 all refer to the following passage from Martin Luther King's "Letter from the Birmingham Jail":

> You deplore the demonstrations taking place in Birmingham. But your statement, I am sorry to say, fails to express a similar concern for the conditions that brought about the demonstrations. I am sure that none of you would want to rest content with the superficial kind of social analysis that deals merely with effects and does not grapple with underlying causes. It is unfortunate that demonstrations are taking place in Birmingham, but it is even more unfortunate that the city's white power structure left the Negro community with no alternative.

4. Martin Luther King was certain that nobody would want to be contented with a feigning type of social analysis that concerns itself only with effects and doesn't deal with root causes.

5. Martin Luther King wrote that the city of Birmingham's "white power structure" left African-Americans there "no alternative" but to demonstrate ("Letter from the Birmingham Jail" para. 5).

6. In "Letter from the Birmingham Jail," King writes to fellow clergy saying that although they "deplore the demonstrations taking place in Birmingham, your statement fails to express a similar concern for the conditions that brought about the demonstrations."

7. My friend Kara told me that she loves living so close to the ocean.

8. Americans are guaranteed the right to freely gather for peaceful meetings.

BEST PRACTICES FOR TEACHERS

Suspecting a student of plagiarism is never pleasant; proving a student has plagiarized is even worse. It's common for teachers to feel offended and hurt when students have acted unethically in their courses. But there are some things you, as a teacher, can do to minimize plagiarism in your classes. Click here for more resources on how to prevent plagiarism in the classroom.

DEVELOPING A STRONG COURSE POLICY ON PLAGIARISM

One can never be too direct in explaining to students what actions can be considered plagiarism in their class. Writing and providing to students a course policy statement that includes a section on plagiarism is an excellent first step. Be sure to include and cite any school policies that might be suspect.

Here, for example, is a statement that Professor Irwin Weiser of Purdue University has used with his Introductory Composition courses:

> The following statement about honesty and the use of sources is from the Introduction to First-Year Composition Courses:
>
>> When writers use material from other sources, they must acknowledge this source. Not doing so is called plagiarism, which means using without credit the ideas or expressions of another. You are therefore cautioned (1) against using, word for word, without acknowledgment, phrases, sentences, paragraphs, etc., from the printed or manuscript material of others; (2) against using with only slight changes the materials of another; and (3) against using the general plan, the main headings, or a rewritten form of someone else's material. These cautions apply to the work of other students as well as to the published work of professional writers.
>
> Of course, these cautions also apply to information you find on the Internet, World Wide Web, or other electronic or on-line sources. Since we will be discussing how to acknowledge and cite sources, you should be able to avoid accidentally plagiarizing anyone else's work. If you are in doubt, please ask me, since the consequences for plagiarism are severe. The university policies about plagiarism include penalties ranging from failure of an assignment to expulsion from the university. In this class, anyone who plagiarizes fails the course, and I will probably inform the Office of the Dean of Students of the reason for the failing grade.

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5.4 WHAT ARE THE DIFFERENT CITATIONS?

MLA STYLE

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Contributors: Kristen Seas, Allen Brizee.

SUMMARY:

Welcome to the OWL Workshop on MLA Style. This workshop will introduce you to the Modern Language Association (MLA) Style for writing and formatting research papers. To get the most out of this workshop, you should begin with the introductory material below, which covers what MLA Style is, why it is used, and who should apply this style to their work. Then you are invited to browse through the OWL's various handouts on different aspects of MLA Formatting and Citations standards, both as sources appear in-text and in final reference page.

MLA OVERVIEW AND WORKSHOP

Welcome to the OWL Workshop on MLA Style. This workshop will introduce you to the Modern Language Association (MLA) Style for writing and formatting research papers. To get the most out of this workshop, you should begin with the introductory material below, which covers what MLA Style is, why it is used, and who should apply this style to their work. Then you are invited to browse through the OWL's various handouts on different aspects of MLA Formatting and Citations standards, both as sources appear in-text and in final reference page.

Note: This workshop should answer most of your basic questions about using MLA Style. However, if you are writing a complex document such as a thesis or lengthy manuscript, or if you have detailed questions, you should consult the MLA Handbook (8th Edition), which you can usually find at your local library or in many bookstores.

The MLA also has a website called the MLA Style Center that allows you to order the handbook online. The site also includes resources for students and teachers as well as answers to frequently asked questions on basic details of MLA Style. Purdue's OWL also has a list of Additional Resources covering MLA Style as well.

WHAT IS MLA STYLE?

MLA Style establishes standards of written communication concerning:

- formatting and page layout
- stylistic technicalities (e.g. abbreviations, footnotes, quotations)
- citing sources
- and preparing a manuscript for publication in certain disciplines.

WHY USE MLA?

Using MLA Style properly makes it easier for readers to navigate and comprehend a text by providing familiar cues when referring to sources and borrowed information. Editors and instructors also encourage everyone to use the same format so there is consistency of style within a given field. Abiding by MLA's standards as a writer will allow you to:

- Provide your readers with cues they can use to follow your ideas more efficiently and to locate information of interest to them
- Allow readers to focus more on your ideas by not distracting them with unfamiliar or complicated formatting
- Establish your credibility or ethos in the field by demonstrating an awareness of your audience and their needs as fellow researchers (particularly concerning the citing of references)

WHO SHOULD USE MLA?

MLA Style is typically reserved for writers and students preparing manuscripts in various humanities disciplines such as:

- English Studies - Language and Literature
- Foreign Language and Literatures

- Literary Criticism

- Comparative Literature

- Cultural Studies

MLA FORMATTING AND NOTATION STYLE

You should start by becoming familiar with the general formatting requirements of MLA Style, as well as the different standards for notation that MLA writers are expected to use. Because MLA is different than other writing styles, such as APA, you should pay attention to every detail of the Style, from general paper layout to abbreviations. The following pages will introduce you to some of these basic requirements of MLA Style to get you started in the right direction.

General Format

- Covers the basic requirements of page layout for a typical MLA manuscript

- Includes general guidelines to apply through the document and specific formatting details for the first page of the paper

- Also provides an image of sample first page of an essay written in MLA Style

Footnotes and Endnotes

- Explains the necessity for using notes and how to use them effectively in an MLA paper

- Covers different reasons for why you may use a footnote or endnote to supplement the main body of your paper

- Describes how to number and format the notes to be consistent with MLA guidelines

Formatting Quotations

- Describes how to format quotations borrowed from secondary sources

- Addresses both short quotations worked into the writer's own sentences and long quotations that are blocked off as distinct material

- Also explains how to omit or add in words properly to clarify the meaning of a quotation

Abbreviations

- Covers MLA standards for abbreviating words commonly use in academic prose

- Describes the different categories of abbreviations: time, locations, academic references, publishers
- Includes guidelines for abbreviating information in citations in a Works Cited page

MLA CITATIONS AND WORKS CITED PAGE

As with any publishing style, the most difficult aspect of MLA Style to master are the requirements for citing secondary sources accurately. The pages included here walk you through the details of incorporating citations into the text of your paper as well as how to compose a works cited page of references at the end of your paper. Read these guidelines carefully. It is important that you refer to your sources according to MLA Style so your readers can quickly follow the citations to the reference page and then, from there, locate any sources that might be of interest to them. They will expect this information to be presented in a particular style, and any deviations from that style could result in confusing your readers about where you obtained your information.

How to Document Sources in MLA Style: An Overview

- Covers the process for developing Works Cited lists and in-text citations advocated in MLA (8th ed.)
- Explains "containers," a concept new to the eighth edition, including how to use them to develop citations

In-Text Citations: The Basics

- Addresses the formatting requirements of using the MLA Style for citing secondary sources within the text of your essay
- Offers a few basic rules for using parenthetical citations, including when not to use such citations
- Includes examples of in-text citations
- Explains the author-page formatting of the parenthetical citation and how that applies to different types of sources
- Provides examples of in-text citations based on the kind of source being cited, such as a literary work, an anonymous work, and work with multiple authors
- Also describes how to cite a source indirectly referenced in another source

Works Cited Page: Basic Format

- Guides you through the general rules that apply to any works cited page using MLA Style, from where the page appears and how to list the works

- Walks you through how to construct a reference entry for different text starting with a focus on author

- Serves as a primer on formatting that will be followed in all of the following handouts on creating MLA works cited entries

- Includes example Works Cited Page

Works Cited Page: Books

- Builds from the basic format page with a focus on how to create citations for types of commonly referenced book sources

- Includes guidelines and examples for a variety of books depending on the number of authors, whether the work is a piece is a larger work, or if the book itself is part of multivolume collection

Works Cited Page: Other Common Sources

- Provides guidelines on how to reference other sources you may encounter during research that are considered books or non-periodical works

- Includes works that you might likely use but have different publication information, such as a government document, pamphlet, and dissertations

Works Cited Page: Periodicals

- Covers the guidelines for developing a citation entry for works found in periodicals, typically articles in circulating publications that have different dates and volume/issue numbers

- Lists types of entries depending on the kind of journal (e.g. one paginated by volume), if the source is a magazine v. a newspaper, or the kind of article the source is (e.g. a letter to the editor)

Works Cited Page: Electronic Sources

- Walks through the basic requirements and unique qualifications for constructing references for different types of electronic sources

- Covers more standard sources from online periodicals and scholarly databases, to less conventional sources like emails and video recordings found online

- Includes OWL suggestions on how to cite weblog entries and comments posted to blogs (NOTE: consult your instructor to find out if these are acceptable research sources to use)

[Works Cited Page: Other Non-Print Sources](#)

- Applies the basic MLA citation rules to non-print sources you may use in your research, such as interviews and images
- Provides directions and examples of how to cite video and sound recordings, as well as three dimensional works like sculptures

MLA Eighth Edition: What's New and Different

- Explains major changes from MLA seventh edition (2009) to eighth edition (2016)

Please Note: If you know exactly what you're looking for concerning MLA, you can use the OWL Navigation to the left by looking under "Research and Citation" and clicking on "MLA Formatting and Style Guide." You may also use the search box at the top of the navigation bar to find resources.

APA STYLE

Contributors: Kristen Seas, Allen Brizee.

SUMMARY:

This workshop provides an overview of APA (American Psychological Association) style and where to find help with different APA resources. It provides an annotated list of links to all of our APA materials and an APA overview. It is an excellent place to start to learn about APA format.

APA STYLE WORKSHOP

Welcome to the OWL Workshop on APA Style! This workshop will introduce you to important aspects of using the American Psychological Association (APA) Style to write and format research papers. You should begin with the introductory material, which covers what APA Style is, why it is used, and who should apply it to their work. Then you are invited to work through the OWL's handouts on [APA Formatting and Writing Style](#), as well as [APA Citations and Reference Lists](#).

NOTE: This workshop should answer most of your basic questions about using APA Style. However, if you are writing a complex document such as a thesis or lengthy manuscript, or if you have detailed questions, you should consult The Publication Manual of the American Psychological Association (6th edition), which you can usually find at your local library or in many bookstores.

The APA also has a [website](#) that allows you to order the book online and read some of their frequently asked questions about APA style. Purdue's OWL also has a list of [Additional Resources](#) covering APA style that you can consult.

WHAT IS APA STYLE?

APA Style establishes standards of written communication concerning:

- the organization of content
- writing style
- citing references
- and how to prepare a manuscript for publication in certain disciplines.

WHY USE APA?

Aside from simplifying the work of editors by having everyone use the same format for a given publication, using APA Style makes it easier for readers to understand a text by providing a familiar structure they can follow. Abiding by APA's standards as a writer will allow you to:

- Provide readers with cues they can use to follow your ideas more efficiently and to locate information of interest to them
- Allow readers to focus more on your ideas by not distracting them with unfamiliar formatting
- Establish your credibility or ethos in the field by demonstrating an awareness of your audience and their needs as fellow researchers

WHO SHOULD USE APA?

APA Style describes rules for the preparation of manuscripts for writers and students in:

- Social Sciences, such as Psychology, Linguistics, Sociology, Economics, and Criminology
- Business
- Nursing

Before you adopt this style for your paper, you should check to see what citation style your discipline uses in its journals and for student research. If APA Style is appropriate for your writing project, then use this workshop to learn more about APA and how to follow its rules correctly in your own work.

APA FORMATTING AND WRITING STYLE

You should start by becoming familiar with the general formatting requirements of APA Style, as well as the different standards for writing that are expected among APA writers. Because APA is different than other writing styles, you should pay attention to everything from general paper layout to

word choice. The following pages will introduce you to some of these basic requirements of APA Style to get you started in the right direction.

General APA Format

- Covers the basic page layout for a typical APA manuscript, including everything from margin widths to the use of headings and visuals

- Includes a general list of the basic components of an APA paper: title page, abstract, and reference page

Types of APA Papers

- Describes the two most common types of APA papers: the literature review and the experimental report

- Outlines what sections must be included in each type of paper, from introductions to a methods section

APA Stylistics: Basics

- Describes three basic areas of stylistic concerns when writing in an APA field: point of view, clarity/conciseness, and word choice

- Explains how poetic language and devices should be avoided in APA reviews and reports

- Suggestions and examples are given for each stylistic issue

APA Stylistics: Things to Avoid

- Identifies the risk of bias in language concerning gender, race, disability, and sexuality when writing up research in APA fields

- Provides links to APA's official guidelines on avoiding bias

- Offers suggestions on finding alternatives to gendered pronouns and using different descriptors when identifying people in your research

APA CITATIONS AND REFERENCE LIST

Perhaps the trickiest part to mastering APA Style is understanding the requirements for citing and listing secondary sources accurately. The following pages walk you through the details of writing citations and developing a reference page at the end of your paper. Read these guidelines carefully! It is important that you refer to your sources according to APA Style so your readers can quickly follow the citations to the reference page and then, from there, locate any sources that might be of interest to them. They will expect this information to be presented in a particular style, and any deviations from that style could result in confusing your readers about where you obtained your information.

In-Text Citations: The Basics

- Addresses the basic formatting requirements of using the APA Style for citing secondary sources within the text of your essay

- Provides guidance on how to incorporate different kinds of references to borrowed material, from short quotes to summaries or paraphrases

In-Text Citations: Author/Authors

- Focuses on various details about referring to the authors of your sources within your essay, which can be difficult to do efficiently if the source has more than one author or has an unclear author (e.g. an organization)

- Describes how to cite indirect quotes, electronic sources, and/or sources without page numbers

Footnotes and Endnotes

- Recommends using footnotes or endnotes to avoid long explanations in the text

- Covers two basic kinds of notes: bibliographic and digressive

Reference List: Basic Rules

- Guides you through the general rules that apply to any reference list developed using APA Style

- Covers everything from where the reference list appears to the capitalization of words in the titles of sources

- Serves as a primer on formatting that will be followed in all of the following handouts on creating APA reference entries

Reference List: Author/Authors

- Walks you through how to construct a reference entry for different text starting with a focus on author

- Notes how the references are different depending on the number of authors or if there are multiple works by the same author

Reference List: Articles in Periodicals

- Builds from the previous handout by looking specifically at how to refer accurately to a periodical source

- Lists types of entries depending on the kind of journal (e.g. one paginated by volume), if the source is a magazine v. a newspaper, or the kind of article the source is (e.g. a letter to the editor)

🏠
HOME

[Reference List: Books](#)

- Builds from the author handout by describing how to properly refer to book-length sources

- Addresses both the basic format as well as requirements for those unique book sources that require you to note specific details, such as whether it is a translation or part of a multivolume work

[Reference List: Other Print Sources](#)

- Offers a short list of other less common print sources you might be citing in your manuscript and how to construct references for them

- Covers examples such as citing a source that is cited in another, or citing a government document

[Reference List: Electronic Sources](#)

- Walks through the requirements and unique qualifications (see the Notes throughout the page) for constructing references for electronic sources

- Covers sources from online periodicals and scholarly databases, to emails.

[Reference List: Other Non-Print Sources](#)

- Focuses primarily on how to reference video and audio texts that are used as sources, from movie clips to sound recordings

- Notes that personal communication (e.g. an interview or conversation) is not to be included in the reference list.

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IEEE STYLE

The Institute of Electrical and Electronics Engineers (IEEE) style is a widely accepted format for writing research papers,[citation needed] commonly used in technical fields, particularly in computer science. IEEE style is based on the Chicago Style.[1] In IEEE style, citations are numbered, but citation numbers are included in the text in square brackets rather than as superscripts. All bibliographical information is exclusively included in the list of references at the end of the document, next to the respective citation number.

LICENSES AND ATTRIBUTIONS

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CHAPTER 6

BEST WRITING PRACTICES

6.1 HOW DO YOU RESOLVE PARAGRAPH-LEVEL PROBLEMS?

UNITY, TRANSITION, AND DEVELOPMENT - MAKING THE STRUCTURE AND LOGIC ACCESSIBLE TO THE READER

A paragraph must exhibit unity, transition, and development. It must contain only one idea, every sentence must focus on that idea, each sentence must connect to the previous and next sentence, these sentences have to lead to some conclusion. To see the trouble caused by the omission of these elements, compare the following original pair of paragraphs with a rewrite:

ORIGINAL

The field of chemical process design has long been divided into two areas: process simulation and chemical information. Recently, with the help of advanced computer technology, process simulation achieved significant commercial success. Several simulation software packages, such as ASPEN, SPEEDUP, and ABACUS, have been widely employed in the chemical industry, from unit operation to plant design. On the other hand, the last fifteen years have witnessed major breakthroughs in the acquisition of chemical information. Ab initio type quantum chemical calculations, armed with ever more powerful computing facility, have been proven to generate reliable physical and kinetic information for a wide range of chemicals. At the same time, chemical databases, such as Chemical Abstract, was able to provide rapid access to variety of chemical information. However, there exists a big gap between the two areas mentions above, and a link needs to be built to

enhance the cooperation between chemical information and process simulation.

The success of process simulation depends largely on the accessibility and accuracy of physical and kinetic information for the chemicals involved. Currently, there are two major ways to obtain chemical information: ab initio calculation and chemical databases.

REWRITE

The success of process simulation depends largely on the accessibility and accuracy of physical and kinetic information for the chemicals involved. Recently, process simulation has achieved significant commercial success with the help of advanced computer technology. Several simulation software packages, such as ASPEN, SPEEDUP, and ABACUS, are widely employed in tasks from unit operation to plant design. Simulation improvements have been paralleled by major breakthroughs in the acquisition of chemical information. Currently, there are two major ways to obtain chemical information, ab initio calculation and chemical databases. Quantum, ab initio chemical calculations now produce reliable physical and kinetic information for a wide range of chemicals, and chemical databases, such as Chemical Abstract, provide rapid access to variety of chemical information. While both process simulation and its information basis have advanced, the linkage between them has not.

The original contains all of the information, but the relationship and connections between the ideas are implicit rather than explicit. The author knows the connections and the savvy reader can piece the information together. The following "improvements" can be made to allow the casual reader to understand the paragraph with minimal effort. In order of occurrence, the changes and motivations to make such changes are the following:

- You can reorder and the first sentence of the paragraph. The first sentence of the original categorizes the two relevant issues simulation and information, but it does not indicate the relationship between these issues. Because the paragraph is about this relationship, it can be the topic of the topic sentence. The first sentence of the second paragraph is the perfect definition of the relationship.

- You can invert the second sentence so the old information comes first, and the new information comes at the end.

- You can replace "on the other hand" with "Simulation improvements have been paralleled" to clarify the two "hands."

- The second sentence of the second paragraph fits in nicely because it categorizes the next two items. You can exchange the connection "at the same time" for an "and;" the issue of time isn't important.

- You can make the "however" transition more explicit with the phrase "While both process simulation and its information basis have advanced."

These explicit transitions improve the ease with which the information can be absorbed. As a bonus, the rewrite is a bit shorter. The rewrite did not change the intended purpose or eliminate important information.

The following is another example of a paragraph rewrite:

ORIGINAL

> The SuperSolder process is a printed circuit board solder application process. It is an alternative to Selective Solder Strip application that should provide thicker solder on land pads and has shown better solder joint reliability. Many assembly houses have already implemented SuperSolder into their processes. The industry is tending toward SuperSolder because it offers many benefits over Selective Solder Strip. Intel, however, must test SuperSolder's reliability and manufacturability in its assembly line before beginning production scale use of this potentially beneficial process.

REWRITE

> The SuperSolder printed circuit board solder application process is an alternative to Selective Solder Strip. SuperSolder's advantages include: thicker solder on land pads, the elimination of expensive photolithography steps, and better solder joint reliability. Because the SuperSolder offers many benefits over Selective Solder Strip, the industry is tending toward SuperSolder; many assembly houses have already implemented SuperSolder into their processes. However, before Intel can incorporate SuperSolder into its own production scale assembly line, the reliability and manufacturability of the new process must be demonstrated inhouse.

In order of occurrence, the changes and motivations to make such changes are the following:

- You can combine the first sentence with part of the second. The clues were the verb "is" and the noun "process," both used twice. The one idea being conveyed is that of a new alternative process.

- You can section off the second half of the second sentence and made it an idea of its own: benefits of the new process.

- You can add a "because" to the beginning of the this sentence to show cause/effect linkage. Putting the "because" at the beginning of the sentence sets the reader up for the sentence's structure.

- You can mess with new and old information order in the last sentence, leading from benefits (at Intel) to the testing that must be done.

As with the previous example, all of the information was contained in the original. While the reader can figure out what the original paragraph means, the document is one of those murky technical documents that give people headaches. The structure, development, and transition can all be improved to create better prose.

TOO MANY IDEAS IN ONE PARAGRAPH

A paragraph ought to have but one idea. The following original has two ideas, one that defines the internet and a one that suggests that the technology and its popularity has led to problems. To reduce an overabundance of ideas in a paragraph, give each idea a paragraph of its own and be sure to connect the paragraphs. Such a fix enlarges the text to make it clearer.

See the next page for an example of how to prevent too many ideas in one paragraph:

ORIGINAL

> The internet is a computer network that connects users from all over the world. The internet is also the largest network in the world. There are currently over 20 million users on the internet according a recent survey by Nielson Research. The internet is sometimes called a "network of networks" because it a superset of smaller networks such as America Online or Usenet. It allows users to communicate via email, discussion groups or hypertext. Other services include file transfer, remote login and indexing programs. Originally, these computer utilities were used solely for scientific research. Now these utilities are being used to exchange pornography and hate literature. The inventors of the

internet never expected the network to be a distribution channel for pornography.

REWRITE

With over 20 million users, the internet is the largest computer network in the world. The internet's vast size results from its status as a network of networks, connecting many smaller networks such as America Online and Usenet. As an umbrella network, the internet allows subnet users to communicate via email, discussion groups or hypertext. Other services include file transfer, remote login and indexing programs. The network's size and utility make it ever more attractive to more users.

The popularity of the internet led to a new set of problems un-envisioned by its inventors. Originally, the internet was used solely for scientific research and defense projects. The architecture was designed to be open to promote collaboration, and the system was distributed so that it could withstand nuclear war. This open, decentralized system has promoted a new degree of free speech: any user can communicate anything to any other user at any time. The unprecedented levels of freedom have lead to unprecedented levels of the abuse of free speech, such as the exchange of pornography and hate literature.

As a rough draft, the original is highly appropriate; nearly all the information is there and the connections are implicit. The rewrite separates the two principle ideas and connects them explicitly. The rewrite makes the topic sentences into contentions in contrast to the supportive nature of the original topic sentences. The rewrite also adds connecting information that is not available in the original.

SURPRISE TRANSITION WORDS

Transition words can sometimes be a surprise to the reader. The author understands the connection and indeed puts in a logically correct transition word. Unfortunately, the logic and connection may come too late for the reader who has either already constructed a possibly flawed logic or is lost. The most common surprise transition words are "thus," "therefore," and "however." Consider the following originals and rewrites:

ORIGINAL

Immunoprecipitation is a powerful technique because the specificity of the immunoglobulin for its ligand is high. Thus, it

allows detection and possible quantification of a target antigen in a mixture of proteins.

REWRITE

Because the specificity of the immunoglobulin for its ligand is high, immunoprecipitation allows detection and possible quantification of a target antigen in a mixture of proteins.

The original is difficult to understand because its structure is not clear from the start. The information about immunoprecipitation is true enough, but the reader doesn't know what to do with the information. The "thus" comes as a surprise. The reader needs to backtrack and remember the previous idea.

In the rewrite, the "because" sets up the structure for the reader immediately: cause/effect. Two boxes are opened in the reader's mind, and the information can now be safely poured into the boxes. As an added bonus, word count is lowered. The meaning has not been changed at all.

Please note that many people feel uneasy starting a sentence with the word "because" and many readers balk when finding such a word at the start of a sentence. The reason for such queasiness is that the "because" clause is subordinate to a main clause. All other things being equal, the main clause should come first; it is the most important. Such a rule may conflict with other information order guidelines. Use your own judgment.

See below for another surprise transition word example:

ORIGINAL

There is much common sense, qualitative information available for climbers on how to place SLCDs. However, this information is based either on anecdotal evidence that lacks an experimental control or on static tests that do not take into account the dynamic nature of a falling climber

REWRITE

While qualitative, common sense information provides excellent guidelines for the usage of SLCDs, this information is based either on anecdotal evidence that lacks an experimental control or on static tests that do not take into account the dynamic nature of a falling climber.

Once again, the first sentence is true enough, but the reader is unprepared for the opposition implied with "however." In the rewrite, "while" alerts the reader to the juxtaposition of ideas that will follow.

LICENSES AND ATTRIBUTIONS

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6.2 HOW DO YOU RESOLVE SENTENCE-LEVEL PROBLEMS?

VERB TENSE

Try to keep verb tense consistent, particularly within a paragraph. When you must change the tense, warn the reader of the transition. For an example of verb consistency editing, see below:

ORIGINAL

> Today's technology is efficient. The Iron Mountain mining operations recovered only 54 percent of the metals from ore.

REWRITE

> While today's technology is efficient, 19th century Iron Mountain mining operations recovered only 54 percent of the metals from ore.

In the above example, "today" and "19th century" explicitly warn the reader of the impending time change.

All too often, the future tense is used to refer to material that appears further on in the document. Instead, simply put such information in the present tense. For an example, see below:

ORIGINAL

> A hybrid system allows symbolic reasoning to complement quantitative reasoning. This paper will give an overview of the Q

theory for constructing hybrid systems and will show that the Q methodology is extensible.

REWRITE

A hybrid system allows symbolic reasoning to complement quantitative reasoning. This paper gives an overview of the Q theory for constructing hybrid systems and shows that the Q methodology is extensible.

PASSIVE VOICE

Below is a sentence written in both the active and passive voice. What changed?

PASSIVE

The body was found by the policeman.

ACTIVE

The policeman found the body.

There are good reasons to use the passive voice and there are good reasons to avoid it.

Use the passive voice to do the following:

- Change the order of information in a sentence.
- Vary sentence structure for variety's sake - readers like variety.
- Eliminate the true subject if it is not important.

Avoid the passive voice because of the following:

- English readers prefer active sentences.
- Passive sentences use more words to express an idea.

WORDINESS

Avoid wordiness in technical writing. For some examples of how to proofread for wordiness, see below:

ORIGINAL

I plan to review the relevant technologies available in the region to generate electricity as well as efficiently irrigate crops in the region to insure that any policy recommendations are thoroughly thought out.

This coupling of a continuous plant with a qualitative abstraction of the plant is called a hybrid system. A hybrid system allows symbolic reasoning to complement quantitative reasoning with symbolic reasoning.

REWRITE

In order to insure that any policy recommendations are thoroughly thought out, I plan to review the technologies that are regionally available for electricity generation and crop irrigation.

This coupling of a continuous plant with a qualitative abstraction of the plant is called a hybrid system. It allows symbolic reasoning to complement quantitative reasoning.

OR BETTER YET

A hybrid system couples a continuous plant with a qualitative abstraction of the plant, allowing symbolic reasoning to complement quantitative reasoning.

ORIGINAL

The purpose of this thesis is to try to develop and verify a model for spring loaded camming devices.

REWRITE

This thesis develops and verifies a model for spring loaded camming devices.

PUNCTUATION

Two things make writers who know punctuation rules feel uneasy about punctuation:

- Convention varies from document to document.
- Authors write sentences that should not be and try to fix them with punctuation, a strategy doomed to failure.

For example, an official use of the comma is to offset introductory matter in a sentence. If the matter is short, the comma may be eliminated. A second use is to connect two sentences joined by a conjunction word. If the sentences are short or have parallel structure, the comma may be eliminated. Both of the following sentence pairs are acceptable.

THE RULE

However, the sky is not blue on Mars.

The ceiling is black, and the roof is blue.

THE EXCEPTION

However the sky is not blue on Mars.

The ceiling is black and the roof is blue.

Some sentences are too long and complicated to punctuate. They can be recognized by their many clauses and conjunctions. Such super-hyper-meta-compound-complex sentences just should not be; break them into shorter, well-connected sentences.

ORIGINAL

It includes an introduction to the subject, the problem to be solved which is to obtain an upper bound to the limit load of welded T-joints with an extension to determine the work required to grow a crack on it, background and further developments.

REWRITE

It introduces the problem of finding an upper bound to the limit load of welded T-joints. The solution method relies on the determination of the work required for crack growth. If successful, this method will be extended to other joint types.

NESTED "ANDS"

A nested *and* is really a type of long sentence with no punctuation, though it can be punctuated at the expense of understanding. See below for an example:

ORIGINAL

The rate gyroscope itself consists of a very rapidly spinning wheel and electronic components which sense changes in the axis of rotation of the wheel, and which modify and output a digital signal accordingly.

REWRITE

The rate gyroscope itself consists of a very rapidly spinning wheel. Changes in the wheel's axis of rotation are sensed by electronic

components, which modify and output a digital signal proportional to the changes.

The previous two examples show sentences that contain more than one idea. The solution is to give each idea a sentence of its own and to connect the sentences.

SUBJECT/VERB SEPARATION

English readers like to see the subject and a verb in proximity. Humor the reader. As a guideline, keep the subject and the verb on the same line.

LICENSES AND ATTRIBUTIONS

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6.3 HOW DO YOU RESOLVE WORD-LEVEL PROBLEMS?

WORD-LEVEL PRONOUNS

PRONOUNS

Pronouns are links to previous nouns. Their misuse is usually due to the author's awareness of the correct linkage and the reader's ignorance of the linkage. Common problems are below:

- *this*: Officially, *this* refers back to the most recently occurring singular neuter noun. Often *this* is misused to refer to the idea embodied in the previous sentence, sentences, or paragraph(s). Modify such usage to let the reader know what the pronoun refers to. For an example of a rewrite of an ambiguous pronoun, see below:

Table 1:

Original	Rewrite
Suburbia is sprawling into farmland. This raises farm prices.	Suburbia is sprawling into farmland. This encroachment raises farm prices.

- *here*: The common mis-usage of *here* is similar to the misuse of *this*. The reader doesn't know whether the author means here on the page, here in the author's lab, or here in the room where the book is being read.

- *there is* and *it is*: These pairs of words often are used to start sentences. They convey neither information nor connections themselves and are thus dead text. Worse, *it* has the connotation of linking back to a noun;

a reader trying to make such a connection will be confused. Recast sentences that start with these pairs:

Table 2:

Original	Rewrite
It is possible to achieve maximum velocity within five seconds.	Maximum velocity can be achieved within five seconds.
There is an immense amount of work that we have to do.	We have to do an immense amount of work.

- Antecedents: The following sentence is funny. It has many problems, but you will get a chuckle when you understand what has been written.

  Trichloroethylene (TCE) is a ubiquitous example of the dense chlorinated hydrocarbons, a family of organic liquids that have recently received great attention from environmental professionals because they are highly toxic and carcinogenic and are capable of persisting for long times in an aquifer and contaminating large volumes of groundwater.

  As written, this sentence claims that environmental professionals are highly toxic and carcinogenic. The pronoun they refers back to the previous noun that matches in number and gender, professionals. The intended target chlorinated hydrocarbons occurs much earlier in the sentences. Often, the reader knows which noun to match from context, but inconsistencies quickly consternate the reader.

- A pronoun that starts a sentence may also refer back to the subject of the previous sentence.

  Bill hit Fred. He went home.

  Without further information, the reader does not know who went home.

- *we*: In technical writing, *we* should only be used to refer to the authors. If there is only one author, make sure that we is taken to mean the author and the author's colleagues. Often *we* is used to mean *the author* and *the reader* or *people in general*. Shun these two misuses. Below is an example of how to avoid misusing *we*:

Table 3:

Original	Rewrite
Given the appropriate GDS model of the target we can fully specify the qualitative abstraction functions and automaton used by our maneuver detector.	The appropriate GDS model of the target fully specifies the qualitative abstraction functions and automaton used by our maneuver detector.

- *you*: Readers don't like to be told what to think. By using the word *you*, an author suggests that a reader thinks something that the reader doesn't necessarily think. Shun the use of *you*.

A LOT

A lot means a lot to the author, but not much to the reader. Be specific about the quantity:

Table 4:

Original	Rewrite
A lot of dentists recommend sugarless gum.	Four out of five dentists recommend sugarless gum.

AFOREMENTIONED, MENTIONED ABOVE

The reader won't know which idea to associate with these constructs. For ideas, qualify and recap the idea for the reader. For an equation, number the equation and refer to the number in the text.

COMMON WORD-LEVEL PROBLEMS FOR ENGLISH AS A SECOND LANGUAGE WRITERS

- subject-verb match
- determiners
- prepositions
- infinitives

Use the English language for 10,000 hours and you will be an expert. Get a native speaker to proofread your text. In the absence of a native speaker, devote proofreading to these trouble spots.

WHICH AND *THAT*

Here are two examples to demonstrate the difference between *which* and *that*:

Table 5:

restrictive clause	non-restrictive clause
Get the lawn mower that is in the garage. (several lawn mowers -- the garage is fundamental)	Get the lawn mower, which is in the garage. (only one lawn mower -- the garage is parenthetical)
Talk to the man who is in the garage. (several men)	Talk to the man, who is in the garage. (one man)

One of the uses of the comma in the above examples is to set off parenthetical information. In the non-restrictive clauses, the information is parenthetical and is offset by commas. In the restrictive counterpart, the clause information is vital to the meaning of the sentence and no comma is used. *Which* is always non-restrictive and always gets a comma. *That* is always restrictive and never gets a comma. For non-neuter pronouns (*who*) the pronoun does not change, but the comma is added to the non-restrictive clauses and omitted from the restrictive clauses. For the sake of the one in ten readers who understand the difference between restrictive and nonrestrictive clauses, be consistent with the convention.

INVOLVE, DEAL WITH, AND *DISCUSS*

These words are vague. Provide more detail; be specific. I see *involve* used in resumes and cover letters to very poor effect:

Table 6:

Original	Rewrite
I was involved in research on high temperature oxygen conductivity.	I constructed the current probes, measured the frequency response of thin film samples, and analyzed data for high temperature oxygen conductivity experiments.

Without additional elaboration, the original sentence could mean that the author provided the researchers with pizza.

UNFORTUNATELY

Often unfortunate for the author, but the whim of fates is rarely of importance to the reader.

OBVIOUSLY

In rough drafts *obvious* is an important flag to the writer; it means the idea is vitally important and care must be taken to make that idea obvious to the reader. Unfortunately, a thing cannot be made obvious merely by applying the adjective. A reader can think three things when reading the word *obviously*:

- It is obvious, so why is it mentioned?
- It is not obvious; the author is stupid.
- It is not obvious; the reader is stupid.

Because none of these modes of thought are productive, *obviously* should be ruthlessly eliminated from final drafts. Instead, take care though to emphasize the point that must become obvious to the reader.

NOTE THAT

Note that is a note by the author to the reader. In a rough draft it means that the information is important but has not been connected to the text. Remove the note and explicitly connect the information to the rest of the text.

SCIENTISTS AND *RESEARCHERS*

Invoking scientists or researchers often makes your text sound like a caricature of a 1950's press release. Usually, these words are used to indicate the importance of an idea:

> *Many scientists have studied PHB, mostly because of its potential use as a biodegradable plastic.*

Such a statement can be interpreted in two ways, depending on the reader's opinion of scientists:

1. Scientists are always right, therefore, PHB is important.
2. Scientists are full of baloney, therefore, PHB is unimportant.

The sophisticated reader wants to know which scientists; at a bare minimum, cite all the many scientists involved. Better yet, get rid of the pesky scientists because they are not important to the story of PHB:

> *The potential use of PHB as a biodegradabe plastic has prompted numerous studies of its physical properties and its production and purification.* [1,2,3,4]

The scientists have disappeared, as has any associated stigma or glory. The people who produced the studies can tracked down if need be through the references.

Putting it all together—how to draft:

Below are some clues that might hint at a needed revision:

- trouble with punctuation

- long sentences/strings of clauses

- passive voice or 100% of sentences have forms of *be* for verbs

- subject-verb separation

- nested "ands"

- *obviously*

- *note that*

Below are some clues that show where you might add more to a section:

- questions

- parenthetical phrases

- long sentences

- one and two sentence long paragraphs

2: "Unity, transition, and development" is a structure used in "Modern Essays" by James G. Hepburn & Robert A. Greenberg (2nd edition, 1968, Macmillan).

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