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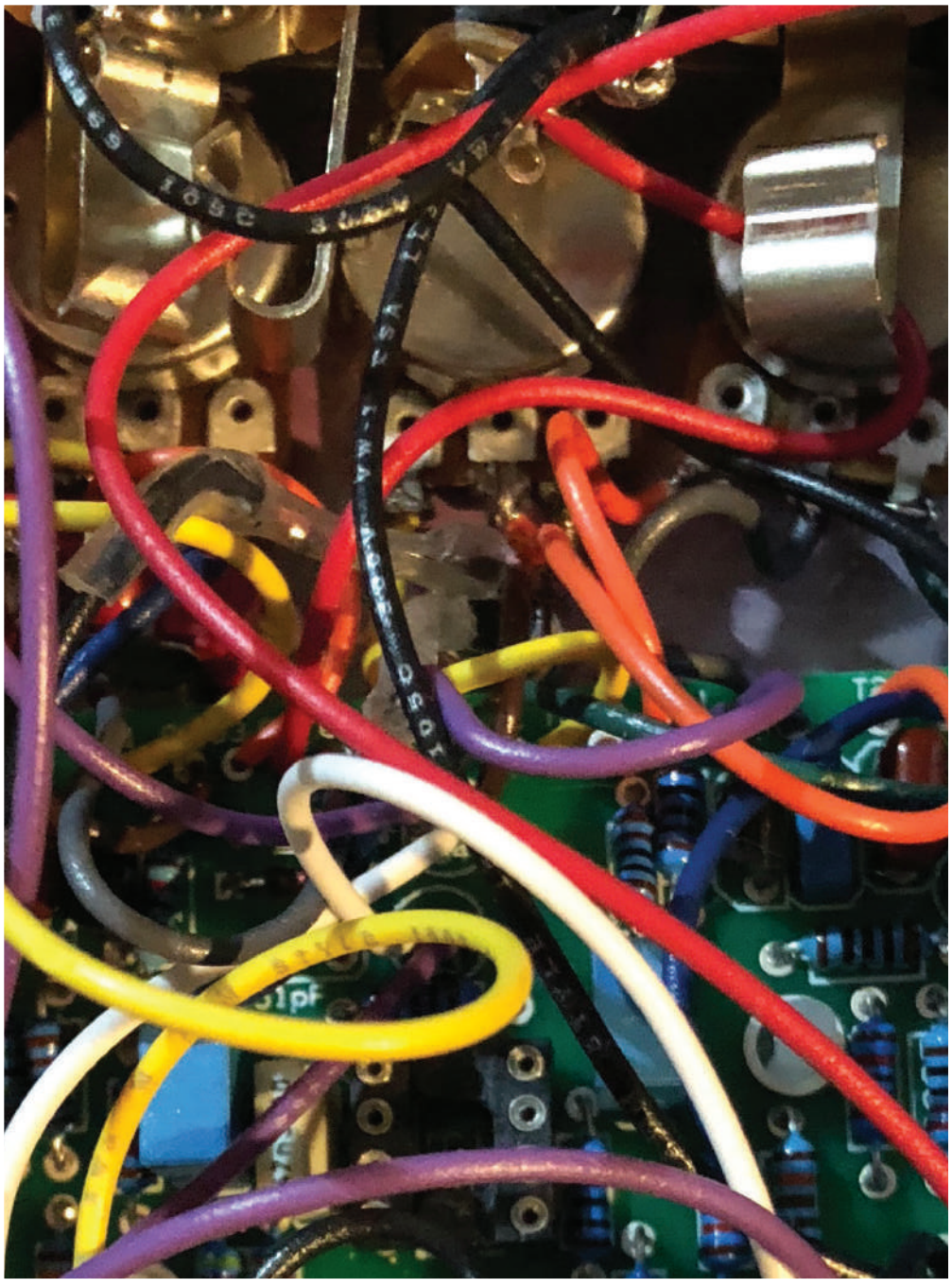
Open Technical Writing: An Open-Access Text for Instruction in Technical and Professional Writing

Adam Rex Pope
University of Arkansas, Fayetteville, arpope@uark.edu

OPEN TECHNICAL WRITING

BY ADAM REX POPE



AN OPEN-ACCESS TEXT FOR INSTRUCTION IN TECHNICAL AND PROFESSIONAL WRITING

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BY ADAM REX POPE

www.adamrpope.com

For my wife, two sons, and daughter.

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A NOTE TO STUDENTS

This is a text that has been designed for you, the student. You may notice that the presentation and style/tone of my writing is different than other textbooks you've run into. You've probably also noticed that the price is different too! All of this is interrelated. Since I've had the total freedom to design this text without the oversight of a publisher looking to make as much money as possible off my work, I've been free to write the way I'd like and in the voice I'd like.

My goal with this text has been to provide you insights into what I see as the fundamental skill sets you need in technical writing. For me, technical writing is almost a way of seeing the world. It isn't based on specific concrete decisions that you always make the same way, but instead it is based on having an approach to researching situations and responding to them as a writer that is concerned with the usefulness and impact of the work they're doing.

This text is designed to give you the pieces you need to create your own approach to technical writing, and I wish you success in that goal!

A NOTE TO INSTRUCTORS

Hi there. Thank you for taking the time to consider this text for your course in technical writing. As you'll see in the student section of this text, I've designed this material to be as student-centered as possible, right down to the very conversational tone of the text. For you an instructor, it will probably be useful to understand my goals behind the text.

In this text, I try to present technical writing as an approach to researching and carrying out writing that centers on technical subject matter. As part of this, each and every chapter is devoted to helping students understand that good technical writing is situationally-aware and context-driven. Technical writing doesn't work off knowing the one true right way of doing things—there is no magic report template out there that will always work. Instead, I've focused on offering students a series of approaches they can use to map out their situations and do research accordingly.

Because of this approach, the text try to dictate exact moves that much, especially when it comes to particular genres like white papers and the like. This is entirely by design. Nothing specific that I could write here would have any amount of a lifespan with a particular genre, so I've opted instead to provide a research framework and some specific tips and tricks with each genre. For researching and teaching a particular genre, I would recommend focusing on the method I suggest to research the genre and then to build your class time around finding example texts and building your own image of what the genre looks like.

Please understand as well that this textbook is the product of a very particular course and student body at my own institution that simply doesn't look like the engineering-heavy group of students that you might see at other institutions. This is not technical writing for engineers and engineers alone, and it doesn't try to be.

When it comes to daily teaching, you may notice I don't have that many chapters. Each chapter is fairly lengthy, and they are not intended to be covered in a single day. Instead, each chapter has major chunks that can be assigned with suggested activities at the end of each major chunk. These activities are provided to give you some direction in classroom exercises to help students internalize and make use of the concepts covered in each section. You don't have to stop each class when a chunk of text terminates with activities, but I've provided these spots to break up the chapters in ways that make sense in my own mind.

As this is an open-access text, I hope to continue editing and growing the body of work here for some time as my schedule allows. I am always open to suggestions and feedback on the text. If you'd like to provide some, you can send emails to my email account for this book @ opentechnicalwritingbook@gmail.com.

CHAPTER ONE:

WHAT IS TECHNICAL WRITING?

WHAT IS TECHNICAL WRITING?

This is a textbook about technical writing. But, what is technical writing exactly? There are any number of definitions of what exactly should or should not be technical writing, just like there are any number of definitions of what should or should not be just about anything that people care about.

Some definitions are different because they are used by folks doing wildly different things. For example, what I consider running might be drastically different than what you consider running. For me, it's going 2-6 miles at a pace of around 12 minutes per mile. You might run considerably slower or faster, shorter or longer, meaning that your definition of running and my definition of running differ because we are simply doing things differently.

Other definitions are different because the folks behind them have an agenda that they're looking to push. For example, some people will stick to their position that pineapple is not a legitimate pizza topping. They stick to that definition because it is meaningful to them. For them to win out and have their definition win out is to win widespread acceptance of their position that pineapple on a pizza is an abomination. (As your author, I have no strong feelings on the subject. Pizza can have a lot of toppings. However, crockpot pizza is not pizza and never will be. You have to draw the line somewhere).

So, since definitions different wildly, our definition of technical writing either needs to be oddly specific to the type of work we're going to be doing in this textbook, or it needs to be fairly broad to encompass as many of technical writing's use cases as possible. Now, either direction is going to leave some folks feeling a bit disappointed in what we've come up with, but I think that the most productive approach is to define technical writing in a broad way that maximizes the types of work and people that can use the term productively. This textbook is after all being designed for a course that serves any number of majors, and it makes no sense for us to play favorites.

GETTING AT TECHNICAL WRITING

Technical writing, as we will be defining it, is writing that conveys information that has to be accurate in order to be of use. This may seem like an overly broad approach to defining the subject, but bear with me and we'll tackle what exactly this means and how to unpack it, as well as some traditional competing definitions of technical writing you may have heard of or may eventually encounter.

Let's start with an example to show how our definition can work. If I'm going to be baking a pizza crust recipe that you've shared with me, there are some things that simply have to be conveyed properly or you'll end up with a terrible pizza. If I tell you to bake the pizza at 550 degrees for 10 minutes, that is one thing. But, if you end up with a copy of the recipe that says to bake at 250 degrees for 10 minutes, you will not end up with my pizza at all. I doubt your pizza would even be edible. In this example, the technical information of how long and what temperature to bake the pizza was crucial. It could not be altered in any significant way without altering the outcome of the baking. It simply can't work without being accurate. In short, the recipe was technical writing.

Going beyond our example, we can expect that almost any cooking recipe would also be technical

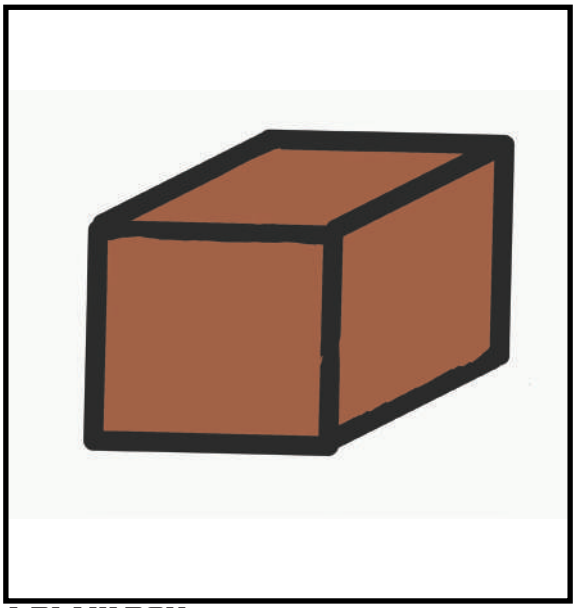
writing since you have to get things together as the recipe requests for the results to be what you're expecting. Yes, you can alter things here or there (or make substitutions), but in doing so you are altering the final outcome away from the expected one. You simply can't toss the recipe out the window and expect it to work. In fact, you'll find that most folks that skillfully alter recipes are able to do so because they understand what is happening in the original and understand what their modifications are doing and how they are interacting with the original set of instructions and ingredients.

Now, before I go further, it should be pointed out that you can take our definition of technical writing and think about things the wrong way. One common mistake that folks make with technical writing is to assume that since technical writing is about the finicky details that you simply need to convey those details as plainly as possible and you're doing the best possible technical writing. In their mind, you're going to be doing the best job when you simply give someone "the facts," and nothing more. It is akin to packing something in a box and then sending it to someone else. You only put "the facts" in the box, and when they open the box, all they get is "the facts."

Unfortunately, this idea is not only wrong-headed—it can cause us to be terrible technical writers. The issue with a "just the facts" approach to technical writing is that the approach makes it seem that the only thing that ever matters is the facts. You can simply package them up and send them along to another person and as long as you managed to get those facts in there, everything is alright. The problem is that this example breaks down whenever you start to question it in the slightest.

To explain what is wrong this mindset, we can actually use the same example from above with a few tweaks. For one, the way a message is packaged impacts how we respond to it. Let's say that you package up your facts in a box and send it to someone. If we take this example literally, then we need to think about what the box looks like. Is it a plain brown box like this:

If it is a plain brown box, does that impact your way of thinking? Do you normally get a certain type



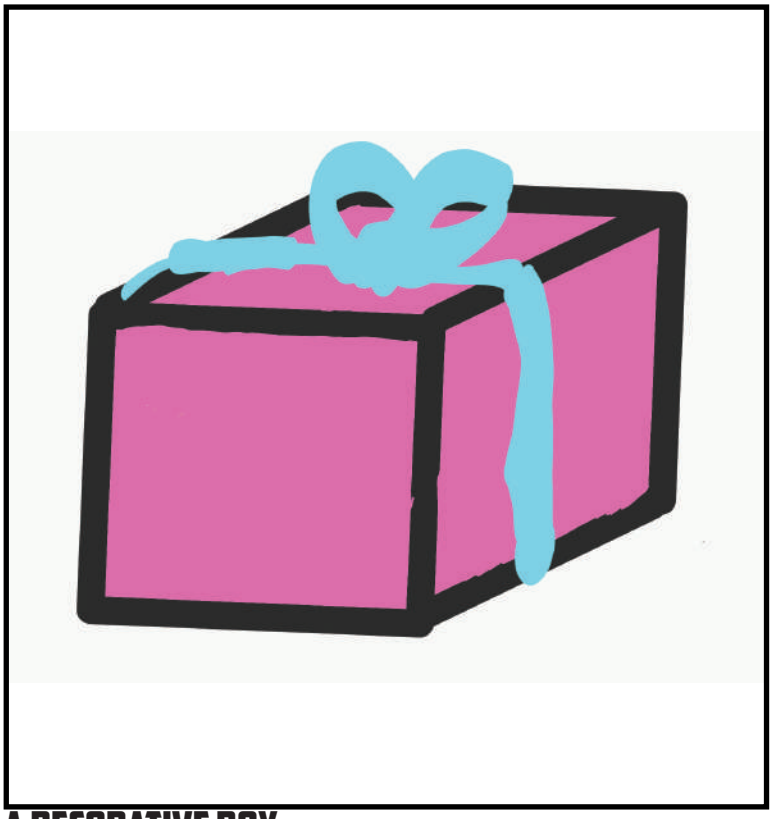
A PLAIN BOX

of thing in a plain brown box? I actually do associate plain brown boxes with a particular vendor I

use for one of my hobbies!

If you get a box that is wrapped in pretty paper with a bow on it, what do you think about the contents? Do you expect to get a bill for $1250 from your last emergency room visit when you open that box? Probably not. And if you did get that, you'd likely be really upset and have trouble handling that information because the box was sending one message while the contents sent another. And you'd likely get kind of mad at whoever sent the box to you this way:

(This is what happens when you get to write an open-access book but can't draw a bow to save your life)



A DECORATIVE BOX

In the same way, the delivery mechanism of a message also impacts our perceptions. If we get a box that is wrapped up in a bow from a friend or relative, we expect that it is a present and likely take it gladly. If we're given the same box by someone we've never seen in our lives, it might not get the same reception. We might ask, "Who is this person? Why are they handing me this gift box?" We definitely wouldn't accept the box without some leeriness, and we might not trust whatever was inside, if we even open it at all. The sender of a message matters as much as the packaging.

Now, if we map these examples back onto technical writing, note that the same principles apply to "the facts." If you get a technical document from someone that you know and trust, you're likely going to treat those "facts" with more trust and confidence because you know the text comes from a reliable source. At the same time, if you get something from someone you don't trust, you may double-check all the information they've given you because you simply don't trust them. This can also apply to the way something is packaged. If you get a document that proclaims to be super-seri-

ous and the contents aren't, you may ignore what is included. At the same time, an official document that looks overdone or fake may get discounted as junk! Both the sender and the way contents are presented matter a great deal! (For example, awful box drawings like the one above may well get some folks to discount open-access textbooks without reading them).

Before we move on to competing definitions of technical writing, I have one more point I want to make, because even with our examples above it could be possible that you have a few misconceptions about technical writing. In our examples below, we're always conveying "the facts," in our messages or our boxes. And, in those examples, it would seem that no matter what we're still conveying "just the facts" once we cut out all the extra cruft. The essential facts never change in those examples, but when we do technical writing they very well can!

Think about it for a moment: do you explain how to use a new app the same way when you talk to a friend and when you talk to an elderly person in your family? The answer is most likely no. There are extra steps involved in one situation, and some steps are omitted entirely in the other. The "facts" of the matter change depending on how well they're going to be understood. You can't simply say "this is how it is" and let things end there with someone who is so wholly unprepared to understand your instructions that they don't even know where to begin. You have to supplement things, add content, and perhaps even alter the way you convey your points. You can't just rely on "the facts" as a stable entity because you'll alter their contents depending on what your audience can understand and what they know and don't know about a given situation.

With that cleared up, let's return to our definition of technical writing: it is writing and communication that conveys essential information that can't be changed without causing damage to the outcome of using that information. But, we take that with the caveat that who shares that information, they way they share that information, and who they share it to, all of these things will have an impact on the final reception of the technical information. Technical writing then, is an act of translation. We may have to alter a great many things so that our reader/recipient properly understands what we're getting at, but we're still trying to get them to understand the same thing we started with. It just may look a lot different after we've translated it for them, and they may treat it differently than they would if someone else had shared it with them.

There is a fundamental shared value we're all working off of—we're not veering into total relativism here. But, we're working with the understanding that what we know and how we use what we know is colored by who we are and how we internalize information. For example, we can all operate with the same cookie recipe, but depending on the person we cooked it with and the way they operated their kitchen and the memories we associate with them, our own mental image of that recipe can be much different than anyone else's. The same recipe may be Grandma's Secret Recipe, the recipe on the back of the flour bag, and that recipe you found online. Same fundamental recipe, totally different treatment of the recipe and use of it depending on your context and how you met the recipe.

As you maybe can tell, technical writing gets intense pretty fast—I mean, we're talking about cookies and relativism in the first chapter…heavy stuff. But, that's what makes it so much fun to study and practice—it isn't simple and it definitely isn't static!

COMPETING TECHNICAL WRITINGS

At this point, I should note that the way we're defining technical writing may be different from other ways you've seen it defined or will see it defined. In my experience, our definition is perhaps overly broad compared to other versions of technical writing, but there is a reason for that broadness.

Some folks like to say that technical writing is something that only belongs to technical fields like engineering or medicine. They might snort if you told them your grandmother's cookie recipe is technical writing just like their specs for a bridge under construction are technical writing. That's a problem because it limits the scope of what technical writing is and what we can study and who can study within the field. It closes off avenues of practice as much as it opens them up.

Historically, folks have used definitions of what is or is not technical writing to control who has a seat at the table, so to speak, in the field. When someone wants to tell you what is or is not technical writing, they're making a power play. They are attempting to define the field in a particular way, usually one that makes sense to them and gives them an advantage. Often times in history this has been used to keep, for example, the work of woman out of technical writing. We may at times be amazed (or maybe not so amazed) at the extent that people would go to in order to keep women or some other group out of a particular field, but it has happened time and time again. Again, definitions are powerful.

So, our broad definition serves a definite purpose—to make sure that we're not excluding anyone or anything that should/could be part of technical writing. An added advantage to that move is that we get a lot more cool stuff to study that we'd be missing out on if we limited ourselves to engineering and closely related fields. Instead, we get to look at any number of texts that are conveying technical information, often in very sophisticated ways, that have been historically overlooked by rather narrow definitions of the field. (Video game theory-crafting comes to mind as one interesting example).

SECTION BREAK—DEFINING TECHNICAL WRITING

1. What exactly is technical writing? How would you define it in your own words? What are some examples of extreme versions of it?

2. How do you define your major or field of study? What other definitions exist at other institutions? What difference do these differences in definition make? Did they impact your choice of this institution?

3. Thinking about definitions, how are categories used negatively or positively in your hobby? Next, what is the most positive definition you can think of? How does each extreme police the hobby or field?

ETHICAL STAKES IN TECHNICAL WRITING

Having talked about what technical writing is and what it studies, I want to focus on perhaps the most important aspect of technical writing that we could possible discuss—the ethical stakes of technical writing and communication. To examine the ethical stakes, we're going to first define ethical

stakes, then look at the way those stakes manifest in the people that use our writing, the laws and regulations that govern our writing, and finally by looking at how ethical stakes operate in institutions and organizations.

WHAT ARE ETHICAL STAKES ANYWAY?

When we talk about ethics, it is worth taking a moment to address the elephant in the room—how do we differentiate morals and ethics? Aren't they the same thing? Why is a course on writing trying to get into moral behavior with me? Look below for my response.

Ethics are rules or regulations that govern behavior. They are usually part of a professional organization's code of conduct, the rules that govern a particular industry or profession, or even the laws of the land. They can also extend into rules and practices in religious texts. But, in each of these cases, the key to ethics is that they are codified—they're written down and standardized for practical application.

Morals, on the other hand, are your own internal compass of right and wrong. They are that little voice in the back of your head that tells you that eating your roommates' donuts while they oversleep breakfast might not be the nicest thing to do. They are individualized and aren't something you can always expect everyone to agree on. Some folks feel strongly about eating certain foods, using certain words, or doing certain things. Those feelings are part of their own moral compass and not something open to universal application or critique.

So, when we're doing technical writing we're mainly concerned with discussing ethical stakes—those rules and regulations that govern what is appropriate behavior and actions in professional or organized settings. Just like with our definition of technical writing, our definition of professional or organized settings can be very broad. After all, we have to account for folks swapping recipes or swapping talent builds and folks who are passing along specs for the material tolerances of a new bridge. In each case, people are being impacted and are working with, ideally, a shared understanding of what ethical behavior is and what is expected of each participant.

Now, with that said I do want to return to morals for one moment. We aren't going to be diving into morals much in this text, but I do want to lay out thing out very clearly—morals do matter in technical writing practice. You should stay true to your moral compass in your professional life. If something make you uneasy or feels wrong, there is a very good chance it is! Technical writing has been used for some very unsavory and downright evil activities simply due to how and where it works—in institutional settings. Just because someone you're working with claims something is ethical and alright doesn't make it so. Ethical codes change over time and evolve, and sometimes they're just wrong. Use common sense and your own morals to guide you. Don't buy into the idea that if the organization or boss says it's alright, it's alright.

TECHNICAL WRITING AND PEOPLE

Technical writing at its core is writing that helps people do stuff, and doing stuff involves some level of risk and responsibility. If you're writing instructions on how to fold an origami boat, then the risk is that you may mess up a piece of paper—relatively low stakes. But, what if you're doing something

much more dangerous and involved? If you're operating a heavy piece of farming equipment, good technical documentation could be the difference between a harvested field and a funeral service—stakes that are life or death.

Since our writing is being used to help folks do stuff, we have to always keep those folks in mind and keep in mind our impact on them. A little bit later in the text we'll get into the business of audience analysis—understanding who we are writing to and what their needs are. Having a firm idea of who our audience is and what they are going to need from our text and what they're already going to know is an important starting point for any good technical writing—even a good cookie recipe!

Suffice it to say for now that ethical writing regarding people hinges on matching up our text to those individuals' needs and expectations. Good and ethical technical writing makes things easy for folks to safely carry out whatever activity the technical writing is mediating. Unethical technical writing puts up barriers for the sake of creating barriers or simply doesn't take into account the user at all. (Often times this comes from writing for the writer and not the reader—you make choices that are easy for you, but not easy for the person using your text, a production-centered mindset that we'll talk about later).

It's possible you've already encountered technical writing that was unethical, or at least edging its way into that space. Sometimes unethical writing can be difficult to recognize if you're not the target of the particular strategy. If you know, for example, how a process is supposed to work, then you're not going to notice if a few minor but important steps are omitted (unless you're attempting to follow the steps literally). If you're used to the language of a particular discipline or workplace, you may not notice when discipline-specific terms are used in public-facing documents in order to prevent laypersons for understanding what is being said and the implications.

Unethical technical writing can be sneaky, so we have to keep an eye out for it. Sometimes you could do some of the above things without setting out to be unethical—you just aren't thinking or you are just taking the easy way out. In other cases, you may encounter folks with an open agenda to disenfranchise or impede others through technical writing. Keep your eyes open and think about what a text looks like from multiple points of view.

TECHNICAL WRITING AND LAWS AND REGULATIONS

Laws and regulations are a huge part of technical writing, and for good reason. Technical writing is only useful if it can be understood, and a large part of how we write is regulated with that in mind. Regulations and laws serve different purposes for technical writing, but both have ethical components that impact the way that we write and work.

Regulations and standards are one way that we impose order on the work we do. Standards can be as basic and universal as making sure that your kilogram and my kilogram are the same weight, but they can be much more idiosyncratic. For example, you have the ASTM standards for skateboard helmets that are different than the standard certification for bicycle helmets due to the different level of impact and types of impacts involved. Someone cruising on their bike is going to have a different set of impacts than someone trying to rock-to-fakie in a massive bowl; the standard recognizes that.

Standards also exist for materials that are used in construction and industry. In fact, a lot of the traditional technical writing associated with engineering came about from the process of standardization! When the steel industry, among other industries, was first coming into its own, you had a lot of mystery behind what made for good or bad steel. If one batch failed and another batch was fine, no one could be sure why that happened. Wanting to maintain consistency and avoid bad steel that could get people killed, engineers took to documenting their processes and measuring their products to develop a durable standard. All of the documentation around this crucial process was technical writing, and it was one of the ways that technical writing and engineering became closely linked.

When we write as technical writers, we have to take into account any relevant regulations and laws that might impact our practice and make changes accordingly. For example, if you're working in a real estate setting and you're listing a house, there are regulations from the U.S. government that you have to follow in order to have a legal listing. Let's say the person that you're working for wants to list their house as great for families with young kids. That's all well and good, but it's also illegal to put into a listing. Housing regulations prevent sellers from promoting a particular type of buyer or avoiding a particular type of buyer for their property. (Though, they haven't always…and the impact of those past choices are still shaping where we live and who we know). If you're writing for real estate, you simply can't talk about the type of family/person that would be a good fit for a home in your listing; it's against the law.

Another example of regulations coming into play would be financial products. You could be writing ad copy for a particular financial product and think, "This is such a great fund—you'll never lose money with this!" That is great and all, but you can't legally say that. Any type of non-guaranteed product in the financial market can't be sold to potential buyers as risk-free when it actually isn't. You can't guarantee things without having a mechanism to ensure what you're guaranteeing.

As writers, we need to be aware of the industries we are writing in and their particular rules and relevant legal regulations. Every industry will be different, but we're required to know the rules of the road when we're writing professionally. For example, if you're teaching you need to have a strong understanding of FERPA regulations. If you're a nurse or medical professional, you need to understand how HIPAA works and what your employer interprets as a violation. (And yes, each of these rules are open to interpretation by specific employers). If you don't make yourself aware of these rules and regulations, you risk opening up your employer or yourself to legal action or fines while simultaneously sharing private information without permission, something that often has serious personal consequences.

Now, some of these regulations and laws may seem burdensome. Sometimes they can be burdensome. But, they are in place for a reason. FERPA exists so that your grades and records are protected. Does it make sharing information about grades more difficult? Yes, yes it does. But, that is the price that we pay to make sure your educational records are safe. Privacy and information security aren't free or automatic. As you work through writing that has burdensome legal regulations around it, try to keep in mind that the extra writing you're doing does have a purpose and that in fulfilling your legal and ethical duties you're likely making the world a safer or better place for the folks being protected by the regulations and laws you're following.

TECHNICAL WRITING AND ORGANIZATIONS

When you're writing in an organizational setting, be aware that you may have yet another level of scrutiny and regulation put onto your work. Organizations have their own standards and their own processes to make sure that things come out the door in a way that is consistent with their desired public-facing image. For example, you might end up using a visual or editorial style guide when you write copy for marketing purposes to make sure that your visuals and your language sync up with the newest campaign that your company/organization is making use of.

With that said, one thing you need to be aware of is that within organizations there can be situations where you may be asked to cut corners or ignore ethical guidelines. You might wonder why in the world someone would create technical writing about an unethical choice or series of actions, but the history of technical writing is littered with corporate scandals that were unearthed via mundane technical writing. From the Ford Pinto to the Challenger explosion to the Volkswagen Emissions Scandal, technical writing and communication goes hand in hand with unethical choices as often as it does ethical ones. Like any tool, you can use it for good or evil.

When you're writing in an organization, there can be enormous pressure to do what's right by the company rather than what's the legal and ethical choice. As a technical writer, and as an individual, it is up to you to make the right choice in these situations. History is full of folks that said, "Okay, I'll do it," in the face of an unethical ask. Be one of the folks that say no. They sleep better at night.

SECTION BREAK—ETHICS IN TECHNICAL WRITING

1. What examples of ethical codes exist in your college experience? What organizations do you belong to or know of that have ethical codes?

2. How do ethical codes shape our behavior as professionals?

3. What types of writing do you think are the most sensitive and in need of the most ethical guidance?

4. Many educational institutions have ethical rules governing plagiarism, write your own version for your classroom in your own language.

PROFESSIONAL VOICE AND TECHNICAL COMMUNICATION

Another fundamental aspect of being a good professional and technical writer is developing a professional voice. One of the things that I tell all my students, graduate and undergraduate, is that there is a clear and fundamental difference between knowing what you're talking about and sounding like you know what you're talking about. The difference between these two is often the presence or lack of a professional persona or professional voice.

What exactly is a professional voice? Well, we could probably spend an entire semester working on just that. Entire books have been written and will be written on style, but for our purposes I define professional voice thus: writing with appropriate authority, allowing sources to back you up rather

than speak for you. That may seem subtle, and in a way it is, but placing yourself in the position of authority is a cornerstone of both coming across as a professional as well as owning up to your responsibilities in a professional setting.

Often times when we're writing as grade school or even high school students, we're put into a position with research where the research itself becomes the focus of our writing. You write a term paper that needs 10 sources, and those sources are the term paper; you're simply creating a vessel for them to be shared with the world. While that type of investigative writing can be useful, the presentation that it lends itself to is not.

When we present ourselves as professionals, we are the ones who have done the research, who know the relevant background information and sources need. If you know it, write and talk that way! (And if you don't, do that work so that you don't end up being one of those folks that sound like they know what they're talking about when they are in fact clueless). Below you'll find a couple of example sentences that lay out the differences I'm conveying. See if you can guess which is professional voice:

Example 1:

> There are a couple of things that apply when we decide whether to build a coal or natural gas plant. According to the Guide to Greenhouse Emissions by Lora Fitts (2015), "there is a large difference between the emissions generated by coal and by natural gas production" (p. 159). Elsewhere, Boris Johnson (2017) writes in Energy Choices for the Future that "building for coal at this point in history is a backwards point of view for any forward-facing organization" (p. 257).

Example 2:

> The research available does not support the choice to build a coal-powered plant on campus. Recent work studying emissions shows that coal has a much more aggressive pollution profile vs. natural gas (Fitts 2015), and the general consensus among experts is that coal is at best a backwards choice for any new construction (Johnson 2017).

Looking at these two examples, you should be able to see a marked difference in the way that the author tackles the subject matter at hand and its presentation. The first example maps to the classic "this is what I read" approach where you simply repeat the wording of your sources verbatim, often while naming the exact book/journal/article that you're drawing on. Now, that is not to say there is not a place for this type of research (there is), but for the most part when you put all of this information in the text, you're overloading the reader with content they really don't need. The Works Cited page of your text is the place for most of this information in a normal setting, and what you're doing is taking the decision-making process and offloading it to experts rather than owning the choice yourself. Even in situations where your job is simply to inform, you should own the collection and presentation of the data you've found!

Notice that in example 2, the author makes a clear point (we should not build a coal plant) and then backs it up with strong statements that are supported by relevant citations. The author isn't hiding behind sources and isn't asking the reader or the sources to make a decision. Instead, the author has

decided what they want to say and is simply telling you what they've found out from research. This is the essence of professional voice—doing the homework and the research and then presenting your point of view accordingly. Instead of talking about your sources, you talk for them and let them back you up. Note that the author doesn't go beyond the sources quoted in the first example, but simply uses them as the backing for their own representation.

Metaphorically speaking, Example 1 represents you, the author, hiding behind your sources. Instead of showing your work and what you think, you throw up the sources and hope for the best. Example 2 takes a different course, using the sources as a backing to make a statement that you feel is correct. In Example 2, you're the one making a firm statement, and if someone wants to question that choice, they can go to the sources you've cited. You've done the homework and now you're telling folks what you think.

For professional settings, Example 2 is often the way to go. One of the more common complaints about student writing is that it often doesn't communicate clearly and directly. Taking ownership of the text and the points, allowing sources to back you up rather than hiding behind them, tackles that problem head-on. Now, that isn't to say that you will never need to write the way Example 1 is framed, but that isn't going to be as common.

Even in a literature review setting, you're being asked to take ownership of the text in a way that simply repeating sources doesn't. A literature review, if you think about it, is the product of you reading all of the relevant literature on a subject and then presenting that research to an audience. You are the one making the call on what belongs and doesn't, and you are the one that is naming the various camps, setting up their arguments, and explaining how they interrelate. That's a lot of work for you, the author, even though you're primarily telling someone what other people have said! It is your literature review after all, and you need to own that for better or worse.

So, when it comes to professional voice and technical writing and communication, keep in mind that you're the expert, the one doing the research and the presentation. Own that role, and make your points with your sources doing the backing. Don't use them as a shield, but use them instead as backup when you make your points. One day, you may not need to use them at all, once you've become the expert in a given area. Think about someone like the late Neil Armstrong—who would realistically question his description of walking on the moon? In a situation where he has explained what that is like, he is the source. He's the expert because an ever-shrinking number of people are primary sources that have actually been on the moon and returned to tell us about it! And eventually, you may be in a similar position in your own niche area of study and professional practice. Until then, use other sources to make your points with appropriate authority.

SECTION BREAK—PROFESSIONAL VOICE

1. Does professional a professional look like in your field of study? What are the physical hallmarks of the field? How does this impact the way the field works and is seen? Is this perception fair?

2. What is the difference between sounding like a student and sounding like a professor in a given

class?

3. What is the difference between sounding like a student and sounding like a professional?

SIGNPOSTING AND TAXONOMY

For our final subject in Chapter 1, I want to mention a crucial duo central to effective technical writing: signposting and taxonomy. These two subjects are closely related, in that signposting relies on a taxonomy of sorts to operate, and is an expression of taxonomy, but they are worth treating individually as well as jointly. In a nutshell, these two tools are used to shape your text so that it has a definite structure that can be seen, ideally, at a glance. We'll get more into the idea of taxonomy a bit later in the text, and in many ways the Cardsorting resource in the back of the text is entirely about these two subjects, viewed through the lens of potential users. We'll look at signposting first before moving to taxonomy and then back between the two.

BASIC TEXTUAL SIGNPOSTING

Signposting is at its core telling your reader what is happening in your text. This signposting happens at two different levels, and both are important to readers in their own ways. The first way that signposting happens is via the text itself. When you use terms like "firstly," "second," "next," and "finally," you are using signposting embedded within the text in a basic way. In addition to this basic approach, you can also do higher level signposting, but let's unpack the basic approach first before adding complexity.

Basic signposting with order-based terms tells your readers a few things, and you need to be aware that you're telling your reader those things! Nothing is worse than when someone is signaling something while not realizing they're signaling anything at all, or when they think they're signaling something else entirely. If you've learned a foreign language, you've run into this issue with the subject of false cognates, terms that sound like words in your home language that mean something drastically different in the language you're now speaking.

When you say something like "next' to your reader, you are indicating that you're working through a series of steps or ideas, and that you are now transitioning from one such idea/step to another. Being aware of this transition and taking advantage of it makes you a more effective technical writer and communicator. These terms are crucial in technical writing because many times the information we are conveying is quite complex. We don't want to be adding to that complexity with even more complexity in our text. When we do so, we're in effect creating two levels of understanding the reader needs to master: they need to master our text and our odd dialect/presentation and they need to master the actual information we're presenting to them. For example, attempting to learn how to put together a set of furniture with instructions written in Middle English presents two challenges at the same time.

Now, I'm mentioning the two levels of understanding that readers have to deal with as separate entities to make a point, but in reality they are not so simple to break apart. Your "facts" can't be

separated from your presentation. "Just the facts" as an approach to technical writing, as we discussed previously, leads to a situation where you simply ignore the impact of your position as the author, of the format you choose for your facts, and even the impact of the medium you've chosen.

To use a metaphor, think about your signposting and textual decisions as one ingredient to a text or recipe. You also have outside information you're including in the text as well, and these different ingredients react to each other while also having their own preparations that impact the way they are expressed. You can simply insert a table of data into a paper in the same way you add a stick of cold butter to a recipe. This impacts the way it works and how you will proceed and how your reader will proceed. You can also take the data from that table and instead of simply pasting the table, you can explain one bit at a time to the reader in paragraph form. This might be the equivalent of melting butter down and clarifying it before use. You have the same ingredient, but it's being processed in different ways with different effects.

The signposts you add are like yet another ingredient, something perhaps like salt or yeast in a dough. To an extent, they are simply altering the way the recipe is going to be operate. More yeast, more rising. But, at the same time, they impart a flavor to the recipe. Yeast bread tastes fundamentally different than non-yeast bread. The same works with signposting in that terms like "next" impact the overall flow of the text and how someone reads it, but at the same time they add a distinct flavor to the text, signaling that this is going to be the sort of text where you get these types of aids, and that in the future you should look for them and depend on them.

Simple, order-based signposts are also an authorial aid—they help you think through your own series of steps and content. You need to know when you're transitioning to use "next" effectively. You need to have an idea of steps to be able to assign points one, two, and three. In thinking about these, ideally you do so through the dual lenses of what you intend to say and who you intend to read your content, tailoring your choices based on those two elements at a minimum.

ADVANCED SIGNPOSTING AND DOCUMENT MAPS

To make the most out of simple signposting, you need to have a larger level of signpost that you can sync up with at the section level as well as at the document level. This is where signposting really shines!

Top-level signposting usually involves a section or document map of some sort. A document map functions just like the name suggests—it provides readers with a list of topics that will be covered or sections that will be present, and it usually does so while mirroring the order found in the text. You may have noticed a few maps in this document already, and if not, look for something with the following format:

In the next section, we'll be looking at the shape of the material, the properties of the alloys that make up the material, and the relationship between these two elements and the friction forces the material creates.

In this example, you have a basic map that is connected to a larger map while also containing a section-specific map. First, you have the connection to a larger map with the terms, "In the next

section." This phrase lets us know that we're moving from one major section to another, likely linking up to a larger list of sections that was introduced at the start of the text or the start of this series of sections. Next, you have the specific map for this section of text with the list of different aspects of the material that will be discussed. This list allows readers to know what will be coming up next, and as they transition through each of these steps, they'll be able to mentally check their progress through the section based on this map. At the same time, they also realize this progression is the next in a larger series of progressions that make up the entirety of a given text.

Don't underestimate the power of this approach! Document maps are essential for almost all technical writing that is more than a couple of paragraphs (and even then, I'd argue they are useful). Using a map, you provide the reader with a clear expectation of what content will be found and what order it will be found in. You can then use this in concert with basic signposting to move between sections/points, or you can combine it with maps in each section listed to provide even more detail to the reader.

And, in larger documents that have a table of contents, all of this can sync up to that table and provide the reader a global view of the document map and the section maps.

SIGNPOSTING FORMAT OR WHY HEADINGS ARE IMPORTANT

Having discussed basic and advanced signposting, I need to pause for a moment to discuss what this can look like in a visual sense. You could, and many people do, simply do all of this work in the text itself. You can locate the maps and the directional signposts in the text and when the reader encounters those maps, they can then use them accordingly. With that said, if you want your reader to get the most out of all your work creating maps of sections and sub-sections, you need to use headings.

Headings like the numerous headings you've encountered in this text already, are the key to making signposts really work for the reader. It is one thing to run into a map and to be able to then identify through the text when the next section has arrived. It is something entirely different to be able to see sections change by browsing through the text and noting the various textual landmarks the map has identified via bolded or italicized or colored headings and subheadings. These headings allow the reader to skim through your text to quickly locate a section they may want to read alone or reread.

In the context of usage, headings can help someone find content in a text that isn't meant to be read as a narrative. Think about car manuals or recipe books. Neither of these texts really shines when you read them front-to-back. Yes, you can do that (and you might when you first get the text), but these texts are essentially a reference for someone who needs a slice of the data in the text. That's also true in report settings where someone only wants the highlights of your text, or they want to see one particular part because of their role in an organization. We'll discuss this more when we get to audience and use and again when we get to genre.

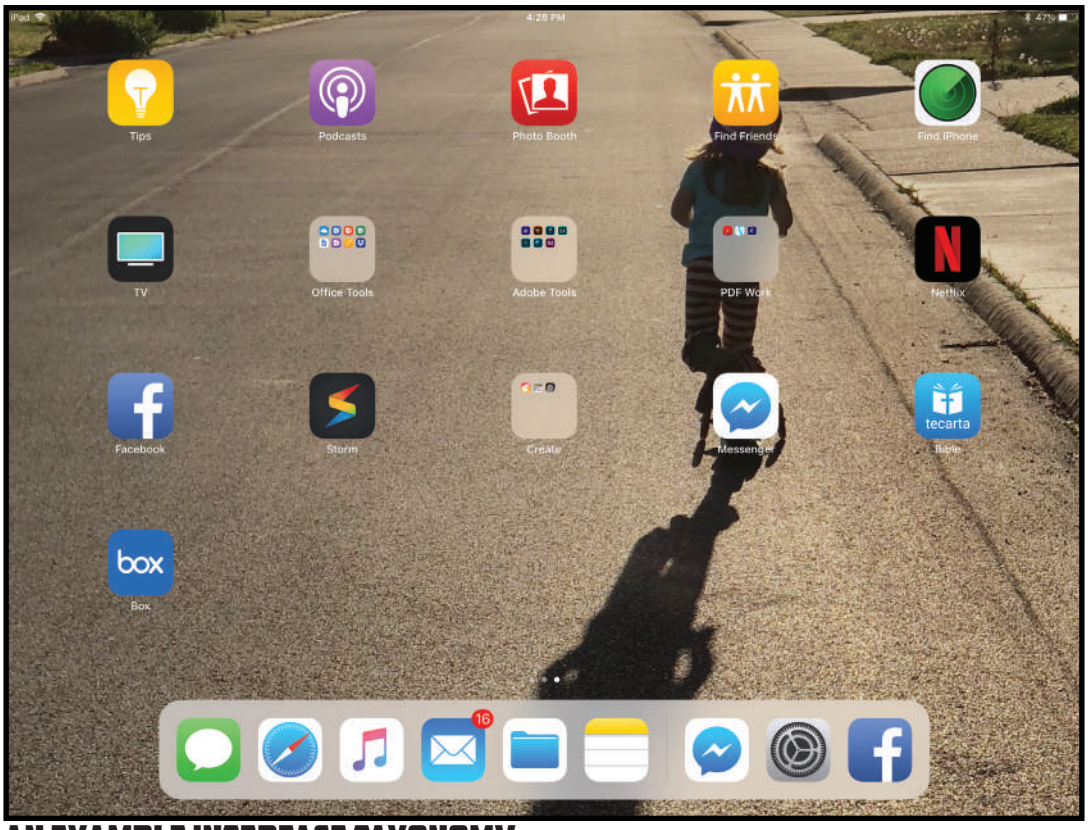
TAXONOMY AND SIGNPOSTING

When we use the term taxonomy in technical writing, we're referring to the way that we divide something in parts or sections. The study of taxonomy is really the study of how you divide something up and the impact of that division. You may wonder how that can be useful in a writing setting, or any

setting at all, so let's dive into how taxonomy can be used in specific scenarios.

HOW DOES TAXONOMY WORK?

One simple example of taxonomy you may not be aware of is the way that you organize apps on the home screen of your phone. A taxonomy requires items and it requires groupings of those items as well as depth to those groupings, something the interface on your phone provides via pages of apps as well as folders. Take a look at the example of the iPad Pro interface I'm currently using as I write this chapter:



AN EXAMPLE INTERFACE TAXONOMY

In the example above, I've got a rather terrible taxonomy that needs some work. I have three major groupings, some are useful and some are not. The overall order of the page seems to have no real sense to it. Why does Tips come first? What is the significance of Messenger next to Create? To be honest, there is no purpose here to those choices. I've simply left them in the order they were installed. All of these form the top level of the taxonomy's hierarchy (we will ignore the shortcut bar for this example, though it does wonderfully compliment the discussion).

When I open up the iPad, these are my choices. I can navigate to the one I want via memory or via reading the various choices available. The advantage of the folders grouping things together is that I'm allowed to have more choices on the same page without muddling things up and at the same time I simplify the choices available. I can make the global choice, Office Tools, when I want to do something Office related. When I want to do something with Adobe, I can use that folder. This

allows me to see those choices as a global choice alongside Tips and Messenger. It is a way of viewing and sorting the content on my iPad. As I said, it is not a very good way of doing this (I've not put a lot of thought and time into it), but it is a way of doing the content sorting.

Taxonomy really does come down to mundane things like my iPad Pro's interface—how do we organize things and how do we label them and the groups we put them into? When it comes to phones and other devices, this impacts the way we use things and the way we find things. The principle also applies to physical workplaces with idiosyncratic stacking and filing methods. Taxonomy is nearly universal, but for the most part we'll focus from this point onward on the impact it has on technical writing.

TAXONOMY AND DOCUMENTS

When you create sections and sub-sections in a text, you are creating a taxonomy in/for your document. You are saying that this major heading describes the content contained within, and that certain sub-sections make sense in certain places. Not everyone will agree with every taxonomy you create, but that isn't the point. The point is that you're putting a sense of structure and hierarchy into place. This can be enormously powerful!

One thing to keep in mind about taxonomies, especially the top level of a taxonomy, is what the taxonomy you've created makes visible and what it hides. Top-level choices are given a great deal of importance and they may be the only level someone ever really reads or considers before diving into your text or passing on it altogether. You need to calculate what you say very carefully to make sure folks know what to find where and what to expect.

If you've ever tried to evaluate four or give different programs at the college level using the respective programs' websites, you know the pain of awful taxonomy choices. One school might choose to put the major plan under "Advising," while another will put it under "New Students," and another will place it under "Academics." Where you will find it on a given website is anyone's guess since the taxonomy is not regularized (this is one of the reasons the standards we discussed previously can be useful—a taxonomy can be universal) or is simply poorly thought out. In many cases with websites you can get to the information quicker by doing a web search with the terms and the university name than actually diving into the site. This isn't an ideal solution, but it is often one bad taxonomy forces on us. (Card Sorting research is one way to fix this, so take a peak at that section in our last chapter for more).

You may wonder how taxonomy and power interrelate. We are after all just naming categories—why would we care about the top level? Well, it comes down to representation and access. Taxonomies have an implicit power structure. Top level content is all of equal importance. Secondary content is less important than top level content, and in theory it is all of equal importance. If there is a tertiary level, it in theory is less important than the secondary level and all content at that level is ideally of the same importance. This is basically how an outline works with Roman numerals:

I. Topic 1

    a. Sub-Topic 1

i. Sub-Sub-Topic 1

b. Sub-Topic 2

II. Topic 3

III. Topic 4

Because of the weight given to the top level, and it's immediately visibility, it provides a level of prestige that the sub-levels don't have. Think about how this can impact something as simple as an organizational chart. Does a unit deserve to stand alone as part of its own subdivision of the organization, or does it get nested under another unit? These are functional as well as political questions. (Office politics gets really interesting around these issues).

ETHICS AND TAXONOMY/SIGNPOSTING

For us, we want to make sure that we're using a taxonomy system that both respects the subject matter and makes content easy to find. Doing both isn't always easy, but if effective communication was something that was relatively easy, everyone would be doing it! Writing and communication classes exist for a reason.

You want to group categories in a way that makes sense to your readers, even if it isn't your natural way to categorize. This sometimes involves research, and we'll cover that later in the text, but it is almost always worth the work. Connect research on how readers classify content with your signposts in the text, sync those road maps up with your document map, and the next thing you know you've got a text that will serve readers well.

Regarding respecting content, you want to make sure that you're treating content with the same level of respect as your readers, and that you're respecting the importance of content when viewing it through an ethical lens. Practically speaking, this often means making sure that you aren't tucking important information that might make your case less persuasive in hard-to-find places. You shouldn't have safety warnings or hidden price tags for projects in places folks are not likely to look or very likely to overlook. Doing so betrays your audience by actively preventing them from accesses the information they would want to see when they are making decisions about your text.

WRAPPING IT UP

In short, this chapter has been about the big picture of technical writing. What is it? Why does it matter? What are some of the simple-yet-important things we need to keep in mind when writing texts on technical subject matter? From this point on, we'll be expanding our knowledge in particular areas regarding technical writing. But, we'll rely on this chapter and the content covered to move forward.

SECTION BREAK—TAXONOMY AND SIGNPOSTING

1. How does taxonomy work in your major? Are there different expressions of the major, or does the major rely on minors for flavor?

2. What taxonomies break up your student body? What are the universal taxonomies, and what taxonomies emerge that are tied to your institution?

3. Study the taxonomy of your major's website. Does it agree with other majors in the institution? Does it agree with other majors at other institutions? Using the Card Sorting research method in the last chapter, take the major sections and sub-sections of the website and test it with folks in the class. How does their ordering of the content differ from your major's website? Which do you prefer? Why?

CHAPTER TWO:
THE USER

In the first chapter, we focused a great deal on big-picture questions about what technical writing is, how it works, where it comes from, and spent a bit of time on some solid tips to follow regarding organization. In the second chapter, we're going to move away from looking at technical writing as something the writer/author works on, and instead look at the folks who are actually being served by the technical writing we're doing. We'll start by looking at the idea of audience and use, before focusing specifically on use and questions of use and how users impact our drafting process. Next, we'll look at usability studies and participatory and user-centered design as a way to approach the question of use. After that, we'll talk about sources and research in technical writing and how those relate to our users and their expectations. Finally, we'll talk about writing in large organizations or institutions and how use differs in those cases.

TECHNICAL WRITING AND THE AUDIENCE

In many ways, the audience or user of technical writing is the most important facet of everything we do (if the first chapter didn't clue you into this fact already). Technical writing is all about conveying complex information to new environments and audiences, and being able to convey information to a new place involves knowing where it will be going and who will be using it there. It is fairly difficult to be an effective technical writer if you don't know who is going to be using your work. The idea that there is some ideal technical writing level that we can all use and understand at the most ideal level is absolutely wrong, as we've discussed before and will discuss again. The audience matters!

Now, you may have noticed that while I'm mentioning audience a lot, the title of this chapter is devoted to users. That may seem like a simple swap, a set of synonyms, but in reality the term user has important implications that audience doesn't always bring along for the ride. When we think about an audience, I would argue that our normal construction is a passive one. There is an audience for a play. There is an audience for a sporting event. There is an audience for a television show. In each of these cases, the audience primarily watches or reads (in the case of closet drama—a play meant to be read rather than acted) a text or event.

Users, however, are not passive. In comparison to an audience, a user is someone doing something. They are going to use whatever it is that they've been given. They're not going to just leisurely stroll through a text—they have a purpose behind their engagement with it. Users use and depending on what they're using, they may have an easy time or a not-so-easy time. For example, one of my best friends is color blind. He uses a lot of video game interfaces as he's playing. Those interfaces are essential to him because he gets information from them to plan his playing. For many years, however, those interfaces have not catered to his ability to see color, and that has caused a great deal of grief for him. Thankfully, more and more modern games cater to users with color blindness and offer different interface color schemes to help users access information clearly using the colors they can see and distinguish between with ease.

As may already be clear, viewing the folks who will be accessing our technical writer as users puts us in a better position to cater to their needs. When we think about users and use, we push ourselves past simply having someone read our text and think about how they might actually use our text to carry out some task or goal. Once we make that leap, we're suddenly asking a lot of really important questions we might not be asking otherwise if we just saw them as an audience. We're asking questions about how our text is going to be used!

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Having said all of this, I'm a hopeless waffler when I write about users and use and audience. You'll likely see me using all of these terms and some more in the rest of this text. Unless I'm making a clear usage of a particular facet of one of the definitions, orient all discussions of audience and users around potential use. Hopefully in the future I'll rewrite all of this and remove my waffling from the equation.

USERS AND THE DRAFTING PROCESS

Now that we've decided that use is going to be important in the way we treat our readers, now we need to dive into how to engage with users as we go through the process of drafting a text. First we'll look at the way that research goes into the drafting process before diving into the questions that we'll use to generate that research on use.

RESEARCH AND THE DRAFTING PROCESS

Good technical writing doesn't come from the nether. You don't sit under a tree and wait for inspiration to strike you in order to create that next bit of amazing technical writing. Now, that isn't to say that technical writing is not creative—it is incredibly creative. However, technical writing is not writing that is built off of the writer's fancy. It is writing that is situated around information and users and use.

In the writing process, this means that often your writing will be driven by research and directed by research. When asking yourself how you should write a given section, you won't simply be asking this question out loud and answering yourself with imaginary sequences of events. Instead, you should be basing your decisions in a good technical document based on what you know about the audience and how they plan on using your text.

In order to make use of information about the audience in our drafting process, we need to fundamentally integrate research into the way that we write. Anything less will result in an awful and inefficient process where we write what we think is needed, find out what is really needed, and then go back and try to reconcile the two before our pressing deadline is a missed deadline. In case you don't get the hint, that is not an ideal way to write.

Now, writing can be a very idiosyncratic sort of thing and everyone has a system that they've developed over time to do writing. Often the system is something like, "I'll do it tomorrow," "I'll do it tomorrow," "I'll do it tonight," "I'll do it in an hour," "I'm doing it now and have to beat the midnight deadline." This is a strategy that can sometimes work in college, but it is not conducive to ongoing professional success. Even if you do have a more evolved process of drafting, I would like to suggest a sequence of writing and research that may be useful. You don't have to adopt it entirely, but I'd ask that you at least consider some of the benefits to the approach and think about how it might be adapted to fit your system of writing.

SECTION BREAK—AUDIENCE AND USE AND RESEARCH

1. What is the difference between an audience and a group of users? What situations might exist where someone moves from being an audience member to a user?

2. Have you ever encountered a text where you were an audience, but you recognize you were not the intended audience? How did you figure that out?

3. What document can you think of that was the worst-prepared for actual use that you've had to make use of? Why was it so hard to use?

TECHNICAL WRITING RESEARCH AND WRITING PROCESS

Below, I'll be discussing what I see as seven phases of the writing process for technical writing. I use the term phases because these are not really steps, but instead ways of viewing the project that you go through. In general, you go through these phases in order. However, you may jump back to the mindset of one phase or another without ever really leaving your current phase. (You might question purpose, for example, while identifying document goals). Or, you might decide once you reach a certain phase that you need to take what you've learned and revert to a previous phase or even the first phase. That might sound horrifying, but some of the best writing comes from those types of responsible decisions. Trust me, if you think it might be best to start over and you don't, someone else is going to eventually see your text and likely come to the exact same conclusion.

WRITING PROJECT PHASES

- PHASE 1: COMING TO A PURPOSE
- PHASE 2A: IDENTIFYING RESEARCH GOALS
- PHASE 2B: RESEARCHING CONTEXT
- PHASE 3A: IDENTIFYING DOCUMENT GOALS
- PHASE 3B: IMPLEMENTING DOCUMENT GOALS
- PHASE 4: DRAFTING
- PHASE 5A: EDITING
- PHASE 5B: TESTING
- PHASE 5C: REVISION
- PHASE 6: PROOFING
- PHASE 7: PUBLICATION

PHASE 1: COMING TO A PURPOSE

The first phase of a writing task is often coming to a purpose. Sometimes this phase, like all of the phases, can take a long time. Other times, you can get through the entire timeline in the space of a minute or two (such as when you're writing a work email).

What usually controls the direct of the first phase is the origin of your writing task—is this something you want to do or is this something you've been asked to do. If you're being asked to do something, you have much less control over the purpose that you're carrying out. If you're doing something on your own, you're going to be able to craft purpose with a bit more control.

IDENTIFYING YOUR PURPOSE

- WHAT AM I DOING?
- WHO AM I DOING IT FOR?
- HOW WILL THEY USE IT?
- WHAT WILL IT BE ABOUT?
- WHEN WILL IT BE USED?
- WHY AM I BEING ASKED TO DO THIS?

The answer to the above questions will give you a sense of your purpose. You don't always need to know all the answers to the above, and really you just want a sketch of the answers at this point. But, you need to know the general gist of each of these questions to have a clear idea of purpose. Once you've figured these questions out, you should have a clear idea of what you will be doing and who you will be doing it for.

For an example, you might be asked to write a white paper on a new service your company is creating. Below, you'll find the rundown for this project via the questions on purpose:

What: I am drafting a white paper, an informational and persuasive text designed to education folks enough to know why they should want a service.

Who: I am doing this work for my immediate supervisor, but really this is a service to the entire company and getting new clients helps us keep the doors open.

How: The reader should use this paper to understand our service and why it is valuable and worth having.

What: It will be about our new service that provides on-site minor medical care for construction firms.

When: It will be used in the early part of the sales process. It may be used as a cold-call tool.

Why: I am a technical writer and familiar with the program and our sales process, so I am being asked to write this document.

Notice in the example above, most of what I'm writing is coming from the writer's own understanding of things. Understanding your purpose, ideally, shouldn't involve a ton of research. You just need to know the parameters of your project and what is going to be required and what will be recognized as success. These are primarily internal metrics, not external ones. Once you know these things, you can move on to the real work of research in Phase 2.

PHASE 2A: IDENTIFYING RESEARCH GOALS

In Phase 2, we move away from the internal understanding of the project we started with in Phase 1 and expand to understand the project from outside perspectives. We'll also carry out research in this phase, so we'll really be going past simply identifying. In doing all of this, we'll be trying to figure out what we need to know to be effective writers in the situation we're currently in. This phase is a long one, but it is one of the most important steps in good technical writing!

To identify research goals, we need to know what we don't know. I won't go into the full Donald Rumsfeld quote on known-knowns and known-unknowns, but we do need to get a sense of what we need to find out. This is a fairly natural course of events if you think about it—what would be the purpose of research if we already knew what we were going to find out?

To help out in identifying what we need to find out, I like to work through a series of questions. (You may be noticing a pattern at this point). Below, you'll find the first set of questions I often ask:

IDENTIFYING RESEARCH GOALS

- WHO IS GOING TO BE THE PRIMARY USER OF THIS TEXT?
- WHO MIGHT THEY CONSULT WHEN READING THIS TEXT?
- WHO MIGHT BE INTERESTED IN THIS TEXT FOR SECONDARY REASONS?
- WHAT LAWS AND REGULATIONS WILL GOVERN THIS TEXT?
- WHO IN MY ORGANIZATION IS GOING TO CONTROL THE RELEASE OF THIS TEXT?
- WHAT WILL THEY EXPECT?

In each of the above questions, we're trying to get at the question of who. We need to figure out the identity of the users of our documents, and we need to know who is going to be assisting them in that use. At first, that might seem like an odd question, but if you examine your own use of important documents as well as workplace practices, it makes more sense.

When you use an important document, you often ask folks that know more about specific parts of that text for assistance. For example, if you're looking over an application for a college, you might ask someone who has applied successfully to that college or another college for assistance in a particularly tricky part. If you're in a business situation and you are reviewing a bid for a new service, you might ask one of your employees or coworkers with expertise in a particular part of the package you don't understand or know much about. In each case, these consultants are not the primary user, but they're using the text nonetheless.

Once you've identified consultants and users, you're going to want to at least consider who might run into this text for secondary reasons. This might be someone who is a competitor—they want to see your text so they can make sure they're staying competitive with your offerings. It might be a news organization that wants to report on your business practices. It might even be an advocacy group that has decided you are their enemy! (For example, you might be building a new shopping development near a historic neighborhood full of folks who simply don't want your traffic in their streets).

The next who you want to identify is the governmental who—which federal, state, and international laws might govern this text? What government agencies might you need to interact with? What will the expect? This question doesn't always come into play, but when it comes into play, it can be of the utmost importance. There is nothing quiet like running afoul of a governmental agency's paperwork demands.

Finally, you're going to want to know who in your organization is going to control this text's release. This might be the person that tasked you with the purpose you're operating under. This might be the legal department. What matters is that you know who they are and what they want. If you've done your homework in assessing Purpose, this may well be the easiest bit of research.

PHASE 2B: RESEARCHING CONTEXT

Once you've identified all of the relevant who answers, you'll need one more pass to do some actual research. Yep, it's time for another list of questions. For each of your who's, you'll need to answer the following questions:

RESEARCH CONTEXT

- WHAT DOES THIS USER NEED FROM THE TEXT?
- WHAT WILL BE THIS USER'S ATTITUDE TOWARDS MY TEXT?
- WHAT WILL THIS USER APPRECIATE IN MY TEXT?
- HOW WILL THIS USER'S POLITICAL SITUATION IMPACT THEIR INTERACTION WITH MY TEXT?

In each question, we're going to be trying to find out what exactly we need to know when we're

doing our writing of the text. With the question on need, we're trying to figure out what use is going to look like for an individual user. With the question on attitude, we're trying to ascertain how we need to present the information to get a good response. With the question of appreciation, we need to know what will win over a particular user. With the idea of politics, we need to know the internal stakes for each user when working with our text. (Note: when we discuss politics in this text, we're almost always talking about politics in the general sense—what groups exist and how will they respond to our choices? We usually aren't talking about political parties and elections and the like.)

These questions likely make more sense when they're given some context. Below you'll find an example of answering each one of these questions for a primary user in our example of the service white paper:

Need: The user will need to know what we offer, how the service is carried out, what the cost of the service will be, the benefits of the service for their business, and the competitive advantage the service will offer them.

Attitude: As this will be drafted as a cold-call document, it will likely be met with some skepticism. In order to get past this, we'll need to make the document quite informative for the users and make sure it doesn't come across as a hard sell from page one.

Appreciation: The users will appreciate timely and up-to-date research on industry best practices. Anything we can do to make the reader feel like they've got a better appreciation of what is current and cutting edge in the business will be advantageous. If we can do this without coming across as someone after a sale at all costs, we'll likely get a good response, even if we don't get a sale for this service at this time. Building a solid relationship matters.

Politics: We will be sending these documents to the owners of the companies we want to address. There will be generally fewer political hang ups over this because they will be the final decision maker. However, there may be some political issues that arise if the employer already has a service provider for healthcare. Additionally, there could be internal pressure from employees or external pressure from governmental agencies to provide better healthcare for employees on the job site, so this may be something we can take advantage of.

For each of your users, you'll want to answer questions just like the example above. As you can see, hopefully, these questions are designed to push you to find out information and to put that information on the page. You can also put these questions on a whiteboard for discussion purposes. Often having generative questions can make group writing more effective because it gives you a way to get the expertise out of each member's head and into the shared discussion space.

GATHERING RESEARCH ON USERS AND CONTEXT

Before we move further into the phases, we should pause to note that the questions above on the context we're researching are fundamentally different than the internal-facing questions from Phase 1. In Phase 1, we could easily answer questions because they were from our own situation and our own circumstances. In Phase 2, especially in 2b, we're looking at other people's circumstances—that's a totally different animal. You can't just wing it when you're answering questions about other people

because you aren't other people. You're you.

To gather information on other people, you need to actually do some research. Some of this research can be research from academic sources and trade publications. Some of it can be from the experiences you've had as well as the experience of others you might be writing with. But, all of that is no substitute for actually interacting with the folks you're going to be writing with!

In the back of this text, you'll find several smaller chapters on research methods. You'll likely need to consult at least one or two of these methods to gather information on the context of your audience/users. To start off, interviews might be a useful place to begin if you have access to the folks you will be writing for. Read through the various approaches' introductions and you'll get a feel for which might fit your situation best.

After you've carried out your research, you'll be in a much better place to make decisions about your audience and writing for them. You'll be able to ask yourself questions and then have data to answer them instead of relying on suppositions, anecdotes, and hunches.

SECTION BREAK—PURPOSE, GOALS, AND CONTEXT

1. When you write a paper in a course, how do you assess the purpose of the assignment? What helps you in this process? What impedes you?

2. What documents can you think of that, in your mind, represent a firm understanding of purpose but a poor understanding of context? Why?

3. Create two short texts, each with the same purpose, but designed with different contexts. They might be a tweet or an email body message or a text. How do they differ and why?

PHASE 3A: IDENTIFYING DOCUMENT GOALS

Once you've identified your research goals and done some research, you'll be ready to move on to the next phase of the writing process, the phase where we turn from users and audience to the structural makeup of our text.

When we talk about document goals, you may be tempted to conflate that with coming to a purpose in Phase 1. While they do sound similar, the focus in Phase 3 is on the actual document—the key features of the text and the expectations that readers will have for it. The difference here is that we're looking at the ways that the actual document, its features and its structure and appearance, helps meet our purpose and satisfy the expectations of our audience. Again, they sound similar but have an altogether different focus.

Document goals come in a couple of forms, each with their own focus and point of view. Some goals are focused on the document's genre—what kind of document is this supposed to be, and what does that kind of document look like? Others are focused on the way the document's structure will be oriented to meet the purpose of the text and the audience's needs and expectations. Taken together,

all of these goals help us plan out the drafting of our text to make sure we're as effective as possible in our writing efforts.

IDENTIFYING DOCUMENT GOALS

- WHAT GENRE WILL THE DOCUMENT BE?
- WHAT TOPICS WILL THE DOCUMENT NEED TO COVER/CONVEY?
- WHAT TYPES OF INFORMATION WILL NEED TO BE HIGHLIGHTED?
- WHAT ACCOMMODATIONS WILL BE NEEDED?

Each of the questions for this phase focus on identifying key aspects of our text's structure and content that will need to be researched to gain a clear understanding of what will be required. Some of this research can be internal, and some may be external.

DOCUMENT GENRE

For the question of document genre, you will need to look to your internal and external expectations. This may be a fairly simply step—your purpose may explicitly discuss what genre will be required. If not, you'll need to do some primary research. Look for similar documents in the professional world that carry out the same goal as yours. What genre are the documents? Are they all the same? Are they different? Identify one genre that you feel would best fit your current goals, or make a mashup that meets your own internal goals.

Before we go further, we should at least address the question of genre in broad strokes. If you aren't familiar with document genres, get ready to gain some familiarity. Genres in documents are just like genres in other areas that we use the same term, be it music, television, games, or novels. In each case, a genre is an approach to something that can be identified by certain characteristics and approaches that are shared by similar texts.

One example might be the police procedural television show. In these shows, the audience follows along with police officers as they go about their daily work. Not all of these are framed the same way of course, and older shows like Dragnet maintain a focus just on the cases, whereas newer shows may focus more on the people doing the policing and their lives, sometimes even with some comedy added in with shows like Castle or Brooklyn 99. In each case, there are certain hallmarks that are echoed by each show that places the show within the procedural genre. That doesn't mean that there are hard and fast rules that must be followed—genres change all the time—but, there are expectations that must be met or at least addressed.

Document genres work the same way. When you think about annual reports, tax returns, grant proposals, or even memos, each of these texts play by a certain set of genre rules and expectations. Often you can see similarities between the function of genre examples taken from any number of places, even if the specifics of how the genre works will be tailored to a specific audience and organization.

Fundamentally, document genres (and others really) represent an approach to working with a given text. A genre is the way that a textual problem has been solved. If the solution was effective, it was likely repeated. As time went by, the solution was tweaked to meet challenges the original approach didn't address. The genre continues onward as a way to meet a challenge until it faces one that it simply can't address. At that point the genre is either retired or fundamentally overhauled to meet the new situation.

To research genre, you should first look to your purpose. Is there an already present genre in your organization you've been asked to create a text within? If you already have a standard format for something like an annual report, use that. You should never go searching for a new genre or a new approach simply because you're making a new text. Unless the genre is no longer solving the problem, keep it as-is. Otherwise, you spend valuable time you could be writing your document trying to come up with a new approach when none is needed.

If you don't have an in-house genre, you need to create one. Look at example documents that are doing the same thing your document is doing. What structural choices are present? What kind of language is used (informal vs formal)? Take notes about all of this and sketch out your own model based on the examples. It will be a bit shaky on the first go, but that's what happens anytime you create a new approach to a technical writing task. This is why versioning and revisions exist.

TOPICS AND AUDIENCE

Once you've got an idea of genre, you need to think about the topics you need to cover. Look at the purpose of your text and look at your audience and their context. What will you need to cover in order to complete your purpose and satisfy your audience?

For example, if you're being asked to write a series of instructions on how to upload video content to the web for grade schoolers, you will approach this much differently than if you were writing the same content for a retirement community looking to get their members more engaged with social media. In the first example, fundamental questions about video, the web, and social media wouldn't need to be addressed. Kids get those things. However, the elderly members of the retirement community may not have a firm grasp of how the web works, how video hosting on the web works, and they may even distrust computers! With that said, both groups would likely benefit from a robust set of tips on privacy, so that isn't to say each group is totally different.

Make a list of your topics and try to make a note next to each item explaining what you mean and why you think that topic needs to be included. You may think this level of documentation is silly (and it would be for something like a three-sentence email to arrange for your friend to meet you for lunch), but being able to look back and explain to your superiors why you've made the choices you did in a document based on research and evidence can be a powerful tool when your choices are called into question or someone wants to know why your work is so successful.

THINKING ABOUT TYPES OF INFORMATION

We we ask about types of information, we're really thinking about formatting. What types of information in your text will need to have custom formatting? Will there be keywords? Will there be

warnings? Will there be cautions? Will there be movies and books listed? Will you be using non-standard characters a lot, such as names in Arabic or Japanese? Each of these questions is a formatting question.

You'll want to make a list of each of the types of information that will have a special format. If you want to be exhaustive, you could even include numbers and symbols associated with chemical formulas or mathematical equations. The goal here is to have a handle on what will be represented in the text.

Once you have a list of these types of information, sketch out what your formatting for each will be briefly. Will caution be yellow? Will warnings be red? Will formulas be inline or separate from text? Sketch out those answers now. If you're not sure, do some research. Look at how others have presented the same data in their texts. If you have an internal style guide, use it. If you have a normal way of doing this in your own organization, use that. Otherwise, do the research and make your notes!

THINKING ABOUT ACCOMMODATIONS

When we think about accommodations, we're trying to identify alterations to the text that will be necessary to make sure our users will be able to use it without unnecessary burdens being placed on them. When we think about accommodations, you'll be thinking about things like the following list:

- Do we have users with special color needs for color-coding?
- Do we have users that will access the text via a screen-reader that will require image captions?
- Do we have users that will need the text translated into another language?
- Do we have users that will need the text written to a specific reading level?

These questions and others will help you identify any accommodations you might need to make.

Your goal here is to make sure you know any sort of need that will be have to be addressed by your or your organization as you write. In some cases, you will have an office in the organization that handles this type of content. In the US, this type of content usually falls under Section 508 rules and regulations when dealing with government agencies. Other countries and organizations may differ in their approaches.

By approaching accommodations early in the writing process, you'll be in a better position to ensure your text will serve its audience well, regardless of the way they'll be reading it.

PHASE 3B: IMPLEMENTING DOCUMENT GOALS

Once we've identified document goals, we need to do some research and planning to get those goals ready to draft. We need to explicitly identify what genre means for us in this context, we need to connect our list of topics with a series of sections in the text, and we need to create a miniature style guide for any special information and accommodations that will be needed.

GENRE REQUIREMENTS FOR DRAFTING

First, we need to explicitly write down how the genre of our text will work. This usually involves two steps: identifying the specific sections that will be needed, and identifying the voice used in the text. For the specific sections, we'll need to identify what sections are expected in our genre. Next, we'll need to make sure we have a consistent voice throughout—this may be casual, formal, or something in between.

For example, if we're going to be working on an annual report, there may be some expected sections that will be present. Now, we're not getting to the point of topics and sub-topics here, but we need to know about major segments of the text. For an annual report, there may need to be a special executive summary that will be present. Knowing that needs to be in the text helps us plan our our writing task. There might also be an expectation of appendices with hard data included. Knowing that helps us make sure the document meets the expectations given by the genre.

When it comes to voice, we just need to make sure we know what voice we're using. This can be the start of our mini style guide. Simply describe the voice and how it should work. Will it be formal with no contractions? Will it be informal with a lot of "you" and other direct address use? Will it be silly? Jot down your goals and then use this later as a rubric for your own writing. This type of work is especially useful when you're working in a team environment where several writers need to use the same voice to write sections that will be combined into one larger document.

SETTING UP TOPICS AND SECTIONS

Next, you'll want to connect your topics that need to be covered with specific sections for the document. You'll want to sketch out the major sections and then map your content to each area. You'll rely on your research on the audience as well as your purpose here to craft a table of contents for your text.

This will be a rough outline of the text and may look something like the list below:

I. Introduction

   i. Salutation to readers (familiar customer for 10 years)

   ii. Background on project (reworking of a project by other contractor

   iii. Description of rest of text

II. Project Approach

   i. Previous work (Current CEO ordered this work)

   ii. Current method (Focus on environmental factors)

III. Project Staff

i. Leadership structure (Emphasize experience)

ii. Team member bios (Structure around leads)

IV. Project Timeline

i. Overall timeline (Focus on Earth Day deadline)

ii. Possible delays and challenges (Highlight variables)

V. Goals and Outcomes

i. Overall project goals (Connect with ongoing relationship and with ongoing relationship and environment)

ii. Rubric for measuring success (Use contract for detailed specifics)

VI. Closing (Personal thanks and contact information)

In the above example, I've sketched out a potential structure for a project report that might be given to a client at the outset of the project, presenting the reader with a simplified and accessible version of the existing technical plans that emphasizes the why of what will be going on. In each case in parenthesis are some notes that will be useful regarding the audience and the writing. For example, when talking about previous work, there is a note that the current CEO ordered the infrastructure being replaced. Knowing this, we would want to be rather gentle with our critiques of what is currently being done—there is no reason to throw our client under the bus, especially when that can make the boss look bad to an entire organization.

In your own work, you may want to follow a structure like the above, or you might try something altogether different. What matters is that you come up with a structure for the text that covers all the content you've identified as necessary while creating sections that make sense within the genre you're drafting, sections that will help this text meet your stated purpose. We're trying to put all the stuff we now know into a plan that we can use for the actual writing work ahead of us.

STYLE AND ACCOMMODATIONS

Last, you'll want to come up with a mini style guide addition that covers any content that needs special formatting or accommodation. A style guide for our purposes is really just a list of things that should be done in the document to maintain consistency. It doesn't have to be complicated, but it does need to be clear and accessible those doing writing and editing. We'll get into this in much more detail later when we talk about project management in a later chapter.

Think about the style guide as the place you go to answer any questions regarding how something should look. When someone is writing a warning, the style guide should give them instructions on how that should be formatted. When someone is including an image, the style guide should list any special instructions for accommodations. The text will work as a reference for your writing, and a living one at that.

Style guides can and do grow over time. Anytime you have to spend more than a moment deciding what something should look like, make a new entry in your style guide. By doing this consistently, you'll make sure you have a record of the choices you're making and an explanation of those choices. In a group situation, this allows you to hash out your approach once and then maintain it consistently across multiple authors and perhaps even multiple documents. In the world of coding, you often see a similar documentation alongside code, but also within code in the form of explanatory comments. In all of the situations above, you're trying to remain consistent and help future you remember what past you wanted done.

The style guide can be fairly simple, as you see in the below example:

Style Guide for Green Infrastructure Project

Voice: The overall voice of this document should be formal, though contractions will be allowed. Formal titles, names, and address should be used throughout.

Major Sections: Each major section should be in Impact font, 14pt, bold. The color for each major section should be green (color code should be decided by end of project)

Sub-Sections: Sub-sections should have titles in 12pt Times New Roman and should use italics. The color should be standard black.

Images: All images should include descriptive captions that will be screen-reader accessible.

Revision Log for Style Guide:

Version 1.0 Original style guide added

Version 1.1 Image caption guidelines stipulated to accommodate screen readers as client has several members of team that will be using these devices.

Again, the style guide doesn't have to be too terribly complicated, but it should be a place you can go to make sure you're addressing document issues consistently throughout your writing. Making a decision once and then referring back to it makes life simpler.

SECTION BREAK—DOCUMENT GOALS AND STRUCTURE

1. What is your favorite genre of television? What do you like about that genre, and how do you identify it? What boundaries can be broken? What boundaries do you consider to be firm?

2. Pick a genre of text like a report or a memo. Find as many examples as you can within ten minutes of searching online. Quickly catalog the examples. What do the extremes look like?

3. Find a style guide online. What types of information does the style guide contain? Why do you think it is there?

PHASE 4: DRAFTING

Though you might have wondered if we'd ever get here, we're now at the phase of writing where they actual document comes into shape—drafting. The drafting phase is the most important phase in that this phase actually creates your text, but it can only be successful if it is built upon a firm foundation of research from the previous phases. (And yes, this is even true of short emails with an abbreviated version of the process).

When drafting, you'll be taking your style guide and section outline and fleshing out the content you'll be creating. In each section, you'll want to draft a text based on your guidelines and your audience research. When you wonder how to approach a particular subject, think back to your research on audience and purpose and genre. Any choices you make should be, whenever possible, grounded in research and tied to your users.

When drafting, I find it is often helpful to skip the introduction of your text and to move directly into the body. An introduction is designed to introduce a text, but that is fairly difficult if no text exists. By skipping your introduction and moving into your body you are able to get going on content you can actually create without needing to know the entire document's content. Once you've finished the text, go back and introduce it. It may seem counter-intuitive, but it helps quite a bit.

As you go, think a bit about how you're saving your text and how it is accessible. You'll likely want to have at least one backup of your text, and you may even want to save versions as you go. This will allow you to revert to an older copy or an earlier point in the process if you realize you've gone in the wrong direction or realize an earlier draft of a section was better than the current one. Saving your text can also be useful when accidents happen. If you lose the device with your text, accidentally delete your current draft, or have a file that gets corrupted, backups make things much less stressful.

COLLABORATIVE DRAFTING

You'll also want to think about making your text accessible to any collaborators. I won't go through the trouble of advocating for any particular type of solution to share with your collaborators—these services change and morph all the time. But, I will say that it is ideal to use some platform that hosts files with synchronized updates when you're doing a lot of work on the same document at once.

If you and your team need to be in the same text at the same time, use a platform that will host the file natively—a platform that lets you edit in browser in real time. If you just need to have the files available, you can use different options that will sync up as you need them to.

Above all, don't use email! Nothing in life is worse than trying to reconcile multiple files and multiple versions of a text into a final document from a chain of emails. Emailing files leads to poor communication in highly collaborative texts. If you're editing, it's not a big deal. If you're actively drafting, it can ruin your text, or at least your life for the duration of the project.

Finally, as you draft collaboratively, think about voice and tone. Make sure you've all got the same supporting documentation to draw on. Make sure that you all have an idea of what the text is supposed to sound like and how it is supposed to relate to the audience and subject. Life is not fun

when you get a text with two to four authors and each author has written with a different tone and vocabulary. At the end of that process you're either rewriting the word choices or putting together a series of texts that simply don't belong together. Neither is fun. Create a style guide. Use the style guide. Love the style guide.

PHASE 5: EDITING AND REVISION

Alright, so you've finished your text. Congratulations. Next, you need to make some decisions based on your goals, timeline, and resources. You may wonder why editing comes first as you gaze at this list, as editing is normally treated as a secondary/final concern—you don't edit something you are going to revise heavily. It all comes down to the decision you'll make based on the three topics I mentioned at the start of this paragraph: goals, timeline, and resources.

GOALS

In some cases, you will want to immediately jump into editing a text when it is finished. Why? Your goal may be to get the text out the door quickly and to respond to a pressing request. This would be a useful workflow if you're writing an email reply to an important client or member of your organization. You need to get information back quickly in this case, so editing immediately makes sense. You aren't going to spend too much time on this text because, frankly, it isn't a major document.

Think about the level of importance of your text—is your goal a simple response or a durable document that will withstand continued scrutiny and use. Some documents just aren't worth as much time as others. That may feel a bit sacrilegious in a writing course, but it is true. If I'm texting someone a quick reply, it is nowhere near as important as a formal assessment document for a graduate program I might be writing the same day. As such, I should set my goals accordingly.

TIMELINE

Another item to consider is the timeline you need to meet. Sometimes, you simply don't have a lot of time. In those cases, you may need to jump directly into editing. In those types of situations, I recommend focusing much of your time on the first two pages. Most readers are going to set their mental image of your in the first few pages; if you have a ton of errors in that space, they are not going to like you very much. However, if your first two pages (or first page even) are immaculate, then you're going to get a less critical reader that will forgive more later in the text. In short, you don't want to trip the "gotcha" response in your reader. If you start out with tons of errors, then it almost becomes a game to find more. If you start out flawlessly, the text becomes a narrative rather than something to be read critically while looking for errors.

In situations where you have ample amounts of time, do not edit first. To do so would be a colossal waste of resources and time. Editing is hard work and it takes a lot of focus and time. You don't want to spend an hour editing three pages that get deleted from the final text or entirely rewritten after testing. If you have more time than a few moments, save editing for last!

RESOURCES

A final consideration is resources. You may note that in the middle of the next section is a testing phase. Testing is an ideal step in any technical document that will be used. There is almost always a gap between what happens in the writer's head and what happens when the text is used. Sometimes that is a gap that has been created because the author is so familiar with a process they skipped a step. Sometimes it is simply a mismatch in terminology between an interface and a document. In any case, testing is very useful. But, it is not always something you have resources for.

Testing really can run a spectrum, something we'll talk about later and in the final segment of this text with research method, but sometimes there just aren't any resources to carry out testing. That may be because of budgets or timelines, but it can also be due to institutional views of the writing process. Some organizations simply don't have testing on their radar as something that is done in technical writing.

In cases where testing is not feasible, go through the text as closely as you can. Think about how accurate the text will be for its intended use. Read the text aloud if at all possible—this catches more errors than you'd realize because of the way we read texts of our own creation. Once this is done, move along to revision or editing, depending on your timeline and goals.

PHASE 5A: EDITING

Editing, as we discussed previously, is going to be your last phase in virtually any writing context. Even when you briefly look over a text before you send it, you are in essence editing. But, it comes first in this list because many times when you are writing you will simply stop here. There won't be time or need for testing or revision. And, as we discussed—that is okay.

When we talk about editing, we usually think about two types of editing—copyediting and comprehensive editing. In some situations, you'll just do copyediting. In other cases, you'll be doing comprehensive editing that goes much further. Think about your goals, timeline, and resources when you make this choice.

COPYEDITING

Copyediting is simply looking for issues in the text related to grammar, structure, and content. Does the text do what is says it will? Do the sections come in the correct order? Are terms used consistently? Is structure consistent? Is the grammar okay? Is the spelling consistent and regionally-situated?

In copyediting, you are looking at the text as a finalized document that needs some checking on the textual level. In a fast-paced environment, this is a quick glance. In a slow-paced environment, this may extend to checking terms in a style guide for consistency with institutional norms and spellings. (For example, if you have British and American clients, you need to standardize color or colour). As in everything, think about your goals, timeline, and resources.

When carrying out copyediting, you want to ask the following questions of the document before

assessing the document via these questions' answers:

COPYEDITING QUESTIONS

- WHAT DOES THE DOCUMENT SAY IT DOES?
- WHAT SECTIONS DOES THE DOCUMENT SAY IT CONTAINS?
- WHAT IS THE VOICE OF THE DOCUMENT?
- HOW IS THE FIRST SECTION FORMATTED?

Once you have these answers, you can then assess the text. I recommend you move through the questions in the order listed above using the answers you've generated as a standard for testing.

For example, if the document says it will teach you how to true a bicycle wheel, does it actually do that? Can you understand the process by reading through the text? If not, you need to revise accordingly. In cases where you are the author, this is simple. In cases where you are simply an editor, pass it back to the author with instructions on what to add.

As another example, the text might reference an appendix that includes a conversion chart for converting dosing from milliliters to teaspoons. Does the text actually have that appendix? If it doesn't, that calls for revision as well. (Or maybe just locating the lost file).

With something like voice or formatting or term use, you want to go by the start of the text versus the rest. (This is based on the assumption the author at least got the first bit the way they intended—that isn't always true, but it can be a good strategy). If the document starts incredibly formal and then swaps randomly in one section to being informal, that requires revision. If the text has blue headings for the first half, it doesn't need to suddenly swap to green with no reason,. The same goes for calling a process by one name and then swapping to another. In technical writing, there is no real need for creative re-naming. Consistency and intelligibility are more important than keeping things fresh and new.

COMPREHENSIVE EDITING

Comprehensive editing is much more involved than copyediting—make sure you have time and resources and it meets your goals. In addition, make sure you do the comprehensive work before you copyedit! Just like with editing as a whole, copyediting is listed first because many times that will be where you stop due to limits in time, resources, or a mismatch of goals with the process.

Instead of looking at the details, comprehensive editing looks at the big picture. Does the document stand together? Does the order of the text make sense? Is the correct audience being targeted here? Should the current sections stay in the text, or should something be added or removed? All of these questions are fair game!

With comprehensive editing, you want to query the document based on the purpose and audience.

This can be as wide ranging or as narrow as you have time/desire for. The following questions can be useful in this process:

COMPREHENSIVE EDITING QUESTIONS

- WHO IS THE PRIMARY AUDIENCE?
- HOW WILL THEIR CONTEXT IMPACT THEIR READING OF THE TEXT?
- WHO MIGHT BE A CONSULTING AUDIENCE?
- WHAT ASPECTS OF THE TEXT MIGHT NEED TO BE TAILORED TO THEM?
- WHAT IS THE PURPOSE OF THIS TEXT?
- HOW DOES THIS TEXT FIT WITH OTHER TEXTS IN THE ORGANIZATION/GENRE?

Once you have these answers, you can start to comprehensively edit the text. Using these answers, you have a rubric for grading the text's content, formatting, and style.

To narrow comprehensive editing to something that fits within this sub-section of the book—I teach an entire course on editing—you can follow the following steps as you go through a comprehensive editing:

1. Check to make sure the text has everything the audience is going to need. If the audience is made up of novices, make sure the text has ample explanation of technical terms. If the audience may need additional resources that will be hard to fine, provide them for the audience.

2. Make sure the text is appropriately ordered to carry out the task at hand. Sometimes when we write texts, we don't always write in the best order for use. Think about the way the text develops. Does it build from one section to another? Does one section later in the text need to be earlier for a section to make sense? If so, consider moving it!

3. Analyze the voice of the text—does it make sense for the subject and audience? Think about who your audience is and what they will think about your subject. Is the choice of voice appropriate? If you have a skeptical audience, you likely don't want to have a super-excited voice that doesn't critically engage with your subject matter. On the other hand, if your audience already agrees with you fully, it wouldn't make sense to be skeptical of everything.

4. If the text has multiple types of users, make sure they can stay in their lanes. Sometimes, a text will have a variety of users that will have different skill levels. In those cases, you need to be wary of how the text is formatted for their use. For example, if you have expert users that know terms and processes, you won't want to label each and every step and process—your expert users will get exasperated quickly. Instead, think about how you can signal that content is for new users. With instructions, you might have a bold, simple instruction for each step of a process that caters to advanced users or those referencing the text. Under that bold text, you can include normal formatting in paragraph

form or just a few sentences that explains what the step means in detail for those who are learning for the first time. Pretty meta, huh?

Once you are done with copyediting, you'll want to revise. If you have time, editing again can be useful, though at some point you'll want to switch from comprehensive to copyediting. You can continually comprehensively edit a text forever. Find a stopping place that honors your goals, timeline, and resources.

SECTION BREAK—EDITING AND DRAFTING

1. When does a document warrant comprehensive editing versus simple copyediting? Come up with some criteria to help judge when a document commands enough importance to require comprehensive editing.

2. Rank the platforms you prefer for group writing, naming your top three. What influences your preference? What features matter when you're writing with others?

PHASE 5B: TESTING

Testing is the middle step of our process, though if you have a great deal of time, it may well be the first one—it depends on your purpose and audience for testing. Testing can have different permutations depending on your resources and timeline. You might simply do internal testing with folks in your organization testing out your work. Alternatively, you could actively recruit testers in the generic sense to go over your text. Or, you could get the actual users that will use your text to test it—and those could be internal or external, depending on what you're writing.

If you are simply passing something along for internal testing, it is more likely that you might send it directly to testers after drafting, or perhaps after a quick edit. With internal testers, you don't have to be as concerned with the polish and finish as you might with external testers—they won't be judging your organization based on this text. However, in some cases where the politics of internal testing are fraught (such as cases where the testers see all of this work as silly), you may want to make sure the text is exceptionally polished.

With external testers, you're going to be either finding folks that fit a generic profile of users or you'll be finding the actual users to test with. In each case, you'll want to make sure the text is polished and doesn't reflect badly on your organization. With a generic profile, you'll just want to find folks that will fit a certain set of parameters to test your text. These may be individuals with similar age ranges or skill levels as your users. Or, it could just be the general public. With actual users, something we'll cover later in this chapter in more detail, you'll be working with the folks who would be using your text to make sure it works as intended.

Testers can be paid or unpaid, but in each case you need to treat their time and experience as valuable. If you pass along a text riddled with errors that looks like a joke, you're going to be wasting your time and theirs. If you go through the trouble of testing a text with outside users, at least make sure you have a polished text!

GOALS OF TESTING

When you're doing testing, you're asking folks to use texts as they are intended; in the process of using them, you're hoping to find problems with the text. You might find that there are terms that are unclear to the average user. You might find an important step is mislabeled or omitted entirely. In each case, you're trying to figure out what happens when your text actually gets used the way it would after it leaves your desk. It may seem like overkill, especially since you're reading this text in a college classroom environment, but testing can save you and your organization time, money, and reputation losses associated with sending an awful text out into the world that simply is not fit for use, or in a worst-case scenario, dangerous.

Later in this chapter, and in the end of the text, we'll get into the specifics of testing. For now, here is a general workflow you can use for testing:

TESTING WORKFLOW

- IDENTIFY WHAT YOU WANT TO LEARN FROM TESTING
- 6FIND USERS THAT WILL BE TESTING YOUR TEXT
- HAVE THE USERS MAKE USE OF THE TEXT IN WAYS THAT WILL HELP YOU LEARN WHAT YOU WANT
- RECORD OR OBSERVE THIS USE, OR HAVE THE USERS SELF-REPORT

Take your findings into the revision process or editing process, depending on the changes needed

With the above workflow, you can get a rough idea of how you can update a text to better fit the intended workflow it will be part of. Later, we'll dive into this with considerably more detail with specific research methods.

PHASE 5C: REVISION

So, it has come to this. For many writers, revision is a bad word. Revision is failure to launch, failure to generate a good text the first time. Nothing could be further than the truth. Revision is central to the production of great writing—almost no one gets it right the first time. In fact, many of the most trusted types of texts, such as peer-reviewed academic work or works published by major presses, are produced in environments that are designed to lead to revision and reflection by the author!

Now, as a note—revision and editing are different in this text, and in general practice. Revision often happens when an author reflects on a text. Editing usually happens when an outsider or a non-author reflects on the text. Sometimes revision will incorporate the suggestions of an editor and will be guided by reviewer feedback. Other times, it is self-contained.

When it comes to revision, you can think about it on two levels: global and local revision. Global revision comes first and involves looking at the big picture of your text; in many ways, it is the author's

side of comprehensive editing. With global revision, you move paragraphs, you check to see if topic sentences are supported by the rest of a paragraph, you delete content or add content as needed. With local revision, you focus on small-scale stuff. Does this sentence sound right? Is this the correct word? How can I fix this comma splice?

For carrying out revision, you want to first make sure you have ample time to actually revise, and you need to make sure you're doing it right. In regards to time, if you are pressed for time, you likely will need to focus more on local revision—large-scale changes to a text can create large-scale problems. If you don't think you have time for a total overhaul, don't half-overhaul. Focus on fixing what is there rather than altering it dramatically. If you do have time, focus on global before local. As with comprehensive and copyediting, you don't want to fix something small that will be deleted later because the larger component it is part of has been removed from your text.

Much of the work of revision maps on top of the work of editing—usually revision and editing are separate parts of a process. Editing identifies the issues, and revision fixes them. (Every editor varies in how much work they do and how much the author does. At the least in modern workflows you'll have to approve changes in your text). In the case of a single author, you often do both at the same time. Your global revision and comprehensive editing are one and the same. In larger organizations, this is broken up into individual roles with different folks doing different parts of the work.

Carrying out revision effectively takes practice—you learn how to best respond to your own writing by responding to your own writing. There isn't one workflow that works best, but below I'll provide some checklists for global and local revision to give you a starting point. Not all of these suggestions will fit every situation, but consider them a good starting point that you can adapt to your own writing. (For example, you might notice after a while that you tend to create a lot of extra "is" formulations where instead of saying "this takes practice," you say "this is something that takes practice." In cases like that, you'll want to focus on finding these "is" formulations because you know that is your kryptonite).

GLOBAL REVISION CHECKLIST

- IS THERE A DOCUMENT MAP?
- DO THE MAJOR SECTIONS FOLLOW THE PLAN OF THE DOCUMENT MAP?
- ARE THERE SECTIONS THAT SHOULDN'T BE IN THE DOCUMENT?
- DOES EACH PARAGRAPH HAVE A TOPIC SENTENCE?
- DOES THE REST OF THE PARAGRAPH MATCH UP WITH THESE TOPIC SENTENCES?

In the above checklist, you focus almost entirely on how the document and paragraphs are structured. The idea is that the document map is your starting point—it tells you what should be in the text and the order that those things should be in. You'll then audit the rest of the text based on that map before descending to the paragraph level and treating each paragraph's topic sentence as a doc-

ument map for that paragraph, auditing each paragraph's sentences to make sure they fit with that text's purpose. You can add in some of the extra checklist items from comprehensive editing if you'd like to make this more thorough.

LOCAL REVISION CHECKLIST

- IF YOU HAVE TIME, READ THE DOCUMENT ALOUD.
- IF YOU ARE PRESSED FOR TIME, READ THE FIRST PAGE ALOUD
- SEARCH FOR ERRORS YOU KNOW THAT YOU OFTEN MAKE
- DOUBLE-CHECK TERMS THAT ARE IMPORTANT FOR THE TEXT
- WORK ON RE-WRITING SECTIONS (IMPORTANT ONES ESPECIALLY) THAT YOU FEEL HAVE POOR FLOW OR READ BADLY

In the second checklist, you're focusing almost entirely on small-scale issues. Reading the document aloud is central to effective local editing (and copyediting many times), because it forces you to actually read each work. Often times when we read, we skim without realizing it. When we read our own work, we tend to both skim and edit the text as we read; we read what we meant rather than what it says. Reading aloud gets around both of these issues and helps with the problem most of us face—we can't stand reading our own work. You can also have your word processor read to you, but I find reading aloud keeps you more focused and able to catch errors.

PHASE 6: PROOFING

Proofing is a phase of the writing process that many guides and writers overlook, but it can be the most important one when it comes to costly mistakes and embarrassing errors. You'll sometimes see it called proofreading. Proofing involves the creation of proofs—samples of your final document with all of the production choices and text choices put into the form they will have in publication.

Proofing is valuable because it can catch errors that won't show up in the drafting process alone. For example, you might think that a certain color combination looks great with a certain type of paper when you're drafting, but when you actually get the printed proof, it looks awful and the colors clash. Or, you might have accidentally used an RGB color code when you should have used CMYK and your text or document has colors that are nothing like what you expected and planned for. Or, you might realize that a choice of font size or style simply doesn't allow for easy reading when placed into a real-world document. Proofing helps you catch these errors before you've paid for an entire run of a document.

In college writing, proofing is not something you run into that much. Most of your writing in classes is often in an office-style program that will go to your professor. Most technical writing, however, goes to outside audiences that will be using your texts. Whereas proofing doesn't usually make sense in college settings because you rarely get something professionally printed and put together, it is a

must in professional settings.

Proofing can be very project-dependent, but a few suggestions can help when you're looking over a proof. We will cover proofing again when we discuss the production process later in the text.

PROOFING CHECKLIST

- DO ALL OF THE IMAGES LOOK CORRECTLY COLORED AND FREE OF PIXELATION?
- ARE ALL FONTS CORRECT OR HAVE SOME FONTS BEEN SUBSTITUTED FOR INCORRECT ONES?
- ARE THE COLORS ACCURATE?
- IS THE PAPER CORRECT?
- IS ALL CONTENT ON THE PAGE, OR IS SOME CONTENT CUT OFF DUE TO BEING TOO CLOSE TO THE BINDING OR TOO CLOSE TO THE EDGE OF THE DOCUMENT (THE BLEED REGION)?
- CAN THE DOCUMENT BE READ EASILY
- ARE THERE ANY ERRORS IN FORMATTING OR SPELLING OR GRAMMAR?

By following through with proofing after final revision, you can catch some last-minute errors and mismatches between what you hoped to find when you created your document and what you find in front of you. Again, proofing is about saving you money and embarrassment—you don't want to print a run of hundreds or thousands of pages with really awkward and obvious errors throughout. Even the best editor will miss some errors—proofing gives you a chance to catch and replace those before you pay money to get them printed and sent out to your users.

If you want to take things to the next level, you can do some proofreading as well. Proofreading as part of the editing process involves taking the last version of the text that was editing and reading through it and the final proof concurrently, looking for situations where changes that should have been made didn't make it into the final document.

PHASE 7: PUBLICATION

Congratulations—you did it. Publication is the final phase of the writing process, a process you may have thought would never end in this text. With publication, you are confident in your text and your proof and you're ready to send it out to the world. Often publication is a matter of logistics and delivery—you want to make sure the write amount of documents get out to the right people at the right time. We'll cover publication more in Chapter 6.

For publication, you have a fairly simple checklist:

PUBLICATION CHECKLIST

- HOW MANY COPIES DO I NEED?
- WHO NEEDS A COPY OF THE TEXT?
- WHEN DO THEY NEED IT?

Once you've made sure you've got your bases covered, the writing process for your document is over! Congrats—it got published.

SECTION BREAK—TESTING, REVISION, PROOFING, AND PUBLISHING

1. Carry out some basic testing on an institutional website of your choosing. Pick a website from your institution you are familiar with and have someone else in the class that isn't familiar with the site carry out some tasks. Make note of how they perform and where they have issues. Prepare a brief report on the test that you could pass along to the webmaster.

2. Revision can be a struggle for almost any writer. What do you struggle with during revision? What tactics do you use to avoid these struggles or to overcome them? Share with the rest of your class and look for common ground and new strategies for succeeding.

USABILITY, USE, AND PARTICIPATORY DESIGN

Having looked at the writing process and the way it relates to use and users, we're now ready to tackle a much broader topic—usability, user-centered design, and participatory design. While the writing process we've looked at is a fairly simple conception of the interaction between the user and the author, this section will dive into a much more hands-on approach that we can and often should use to make sure our work is going to match up with the needs of actual users. We have so much we can learn from our users: they are the world's foremost experts on the tasks they carry out on a daily basis.

USABILITY AS AN APPROACH TO WRITING AND DESIGN

Usability is entirely oriented around use—how easy to use is a device or a system or a building or a text? Does it allow different types of use? Does it guide users to use it correctly? Is it open to users with different accessibility issues? All of this and more come into usability, though the term gets thrown around today in ways that more often than not imply a sleek design rather than a usable one.

For us, usability and user-centered design come down to putting users and use before production-oriented concerns. This isn't always possible to the extent we'd like, but it is an ideal that we should continually strive towards. After all, our documents are supposed to be used and should be designed around that use rather than their production.

What does production-centered design look like, and how is user-centered design different? Production-centered design is a design process where we write or design a document in a way that makes things as simple as possible for us, the person doing the writing, or our organization, the group putting the writing out into the world. What is easy for you is not always easy for users. Sometimes there are legitimate production-centered issues that impact users, such as two-factor authentication that makes logging into a service much safer, but also more of a hassle. However, most production-centered issues come to placing the author before the user.

For example, you might use your own terms or disciplinary terms in a document that is meant for the general public. Production-centered design focuses on gets the text out the door with the most efficient and writer-centered choice available. Often, that choice is simply keeping complex terms. After all, if someone really wants to understand what is going on they'll do the research. Right? Unfortunately, internal or disciplinary terms can be an insurmountable barrier to some, or may turn some readers off a text entirely. Think about water quality reports and ingredient lists on packages—if you don't understand what the words mean, you've got to do a lot of digging to figure them out, and even if you figure them out, you may not know what the associated text means for you. Should I be worried about turbidity or anhydrous dextrose? Production-centered design leaves that question up to me and the Internet. That's an awful combination.

User-centered design takes a different tack entirely. It asks what the reader needs from a text to make use of it effectively, often couching that question in actual research with users in the manner that we've discussed previously. While this is more work, it often results in documents that are more effective and users that are much more fond of your organization and your work. While many organizations talk about usability as part of their workflow, not very many actually go through the trouble of making their work user-centered as opposed to production-centered with some lip service to users at the tail end of the development process. You can think about user-centered design as a competitive advantage!

What does usability as an approach look like? We can visualize it with a simple comparison of the two different approaches as competing workflows:

Production-Centered Design

1. Assess purpose
2. Draft Document
3. Edit Document
4. Test Document with users (optional)
5. Revise document lightly
6. Publish

User-Centered Design

1. Assess Purpose Internally
2. Assess Purpose with users
3. Finalize purpose weighing internal and external factors
4. Draft document
5. Edit document
6. Test document with users
7. Revise document as heavily as needed
8. Publish

In the two cases, the difference is how quickly the user is consulted and how aggressive that consultation is. The two permutations above are aggressively different, though user-centered design can operate on a spectrum between highly involved and lightly involved. The main difference is that users are taken into account from the start. At the extremes of production-centered design, users are an afterthought at best. They are simply the people that make the document or system work, and the document or system's effective circulation/operation is the most important consideration.

Now, sometimes we do have more production-oriented designs for special reasons such as security. If you are writing documents that contain highly sensitive documentation, you may have a more production-centered workflow that doesn't let you open up your text to users as much. Why? Because things that would make the document easier for users would also comprise the security of the workflow. Sometimes we pay a price in ease of use for added security in technical writing settings. With that said, a good technical writer goes to great lengths to minimize the impact on readers in such situations.

The drafting process we sketched out earlier in this chapter you may note is closer to the production-centered design end of the spectrum than the example above because purpose is primarily seen as being an internal matter. Practically speaking, this is a concession to political realities—you often are not given enough time and space to assess purpose with your users and your organization. In an ideal world though, that is part and parcel of the design process. Note that you could easily add external users to our process from earlier and make your process instantly more user-centered.

PARTICIPATORY DESIGN

At the extreme end of the user-centered design world is what is known as participatory design—design where the user is a participant from the get-go, much like the example we just finished discussing. This kind of work is hard, but the benefits can be immense. The major difference between user-centered and participatory design is agency. Participatory design gives the user agency and control over the design process rather than simply consulting them for more data to help make decisions

about the writing process.

When it comes to letting users into the process of drafting a text at the start (and giving them agency), things can get tricky matter. There are ethical concerns—users might criticize their boss and their boss might find out! There are also logistical concerns—how do you end up getting good information from folks and getting them together with designers? And, there are political and financial concerns—how do you convince your organization to let users help you think through things and spend time that could be used drafting to communicate (and possibly compensate) your readers?

With that said, participatory design can be a huge boon for your organization because your readers and users know more about what they need and want than anyone out there! Often times when users work, they work around bad workflows and bad documentation. How many times have you seen in a professional environment a situation where a document or piece of software is lightly used or misused? Think about a clinical setting where someone is putting information into a client management software system—many times huge sections of the system are skipped because they simply don't fit the need of the office, but the software wasn't customized to those needs so they are there anyway. How many times have you been handed a form and someone tells you, "don't worry about that—we never use it!"? In each of these cases you have documents being misused because they don't fit actual workflows or they impede them.

By taking what users know about how things actually work and what they actually need, you can make a better document, build a better experience for users, and make everyone happier in the process ideally. You can remove content that isn't going to be needed, you can add content that is needed but not present, and you can build a relationship with the folks you interact.

With all of this said, participatory design isn't a fit for every situation. In some cases, users want things that are not possible for legal reasons. In the case of real estate, the user might want to indicate the type of buyer they want for their home. That's illegal. In other cases, the benefits just aren't worth the cost. Participatory design is not for every situation, but for situations where your users are going to be incorporating a document heavily into the way they work and operate, it can be useful.

DOING PARTICIPATORY DESIGN

Having talked a great bit about participatory design, what does that workflow look like? An extreme commitment to participatory design can be seen below where I've sketched out what an example might look like where you commit from the front to back of a design process to working with users rather than for users. Again, this is not practical or even advantageous in every situation, but in the right circumstances it can be invaluable! (And, this is just one suggested workflow—it by no means represents the entirety of participatory design).

PARTICIPATORY DESIGN WORKFLOW

1. BUILD RELATIONSHIP WITH USERS—FIND OUT WHAT THEY LIKE AND DISLIKE ABOUT DOCUMENTS
2. COME UP WITH PARAMETERS FOR THE DESIGN PROCESS—WHAT WILL BE THE SCOPE AND TIMELINE?
3. ARRANGE TO WORK WITH USERS TO BRAINSTORM IDEAS ON THE DOCUMENT'S PURPOSE
4. COME TO AGREEMENT INTERNALLY AND EXTERNALLY ON PURPOSE
5. DRAFT A SKELETAL OUTLINE OF THE DOCUMENT/SYSTEM
6. CONSULT WITH USERS FOR FEEDBACK AND COMMENTS
7. REVISE THE DRAFT/SKELETON
8. CONSULT WITH USERS FOR FEEDBACK AND COMMENTS
9. COMPLETE THE DOCUMENT AS ENVISIONED
10. TEST THE DOCUMENT WITH USERS, SOLICITING FEEDBACK AND SUGGESTIONS
11. REVISE THE DOCUMENT AS HEAVILY AS POSSIBLE, POTENTIALLY REVERTING TO STEP 4
12. TEST THE DOCUMENT AGAIN
13. REVISE THE DOCUMENT AS NEEDED
14. PUBLISH THE DOCUMENT
15. CONSULT USERS REGULARLY ON THE DOCUMENT'S IMPACT AND UNFORESEEN ISSUES
16. REVISE PERIODICALLY WITH USER'S INPUT AND CONSULTATION

As I have mentioned, the above is a heavy investment into working with users. It isn't always the best choice, but it can literally give you information that can be found nowhere else and can help you find solutions to problems that you aren't even aware of that impact the way your organization and those that use its documents operate.

WHEN TO USE PARTICIPATORY DESIGN?

In an ideal world, I suppose you would use participatory design for every single major writing project. After all, folks should have a say when things are going to impact how they work and live. But, we don't live in that ideal world and we often have to work in environments that aren't open to participatory design. So, when should you take the time to aim or participation? The checklist below can help you think through this question:

PARTICIPATORY DESIGN ASSESSMENT

- DO MY USERS OPERATE WITH MY DOCUMENT IN WAYS THAT I DON'T UNDERSTAND?
- DO I OFTEN SEE USERS USING DOCUMENTS IN WAYS DIFFERENT THAN INTENDED?
- ARE THERE PROBLEMS BETWEEN THE WAY FORMS ARE FILLED OUT AND HOW MY ORGANIZATION USES THEM?
- DO I HAVE A RELATIONSHIP WITH THE USERS THAT I CAN LEVERAGE?
- CAN I HAVE USERS PARTICIPATE IN AN ETHICAL AND LEGAL WAY?

Answering the questions above can give you an idea if you have enough benefits to start to make an argument for user-focused participatory design. If your organization doesn't already use participatory design, you may have to start with baby steps, working your way towards this process with some user-centered choices. In all such situations, be on the lookout for ways that you show the benefits of getting outside feedback—you need to be able to explain how working with users benefits the bottom line.

What might things look like if your organization and your users are going to benefit from participatory design? One example might be the process of buying real estate. Buying a home or other type of property is often a dizzying task for many first-time buyers. You have to consult a bank, you have to find a realtor to work with, you have to tour properties, understand loan options, make bids and assessments of value, navigate inspections—all kinds of peril await! But, what if the process was full of documents that were designed in participatory ways?

In such a scenario, a real estate group would consult with the types of first-time and recurring clients they operate with. They would ask the clients what types of things they do well, and what types of things they don' t do so well. They might focus on things like client education. When a real estate relationship starts, how much information is shared with the client? Perhaps a client is going to be buying a rural property that is eligible for federal grants for rural development. What does the client want to know? How would they use that information to assess things? Those are questions that only the real estate group could answer by workshopping with clients about what is valuable and not-so-valuable.

With recurring clients, maybe more of the information revolves around getting loans and paying taxes when you are buying multiple properties, operating as an LLC or other legal construct, or operating across state lines. In those situations, the same type of workshopping with clients could be advantageous. You can identify what they need, what they ignore in current information, and the times and places they simply need questions answered that you either aren't answering or aren't being asked in the first place.

The outcome of these workshops would likely be a draft of some informational documents for the clients, documents which could be tested with clients as they navigate the process, and documents that could be assessed at the end of real estate deals for suggestions to tweak them on an ongoing basis.

The end result of all of this would be a series of real estate documents and a workflow for clients that would likely go above and beyond what is found with other real estate groups. Yes, there would be a cost, but the benefits would be immense with clients having a firmer understanding of their options and a greater connection with the real estate group and appreciation for their efforts to make the process as demystified and clear as possible.

SECTION BREAK—USABILITY AND USERS

1. Where do you see usability referenced in your daily life? How is it used? Do you think these representations reflect on what we've discussed? Why or why not?

2. Think about your own institution: what systems on campus could benefit from a user-centered or participatory design approach? Why do you think this would be beneficial? How would you argue for this change with the upper administration in terms that they would appreciate?

INSTITUTIONAL WRITING

Having looked at drafting and design and usability, we will close this chapter with a few notes about writing in institutional settings. When you write in an institution, you operate differently than when you write in your college classes or when you write on your own. The institution will have its own conception of what it does, how it is seen, how it operates, and what it expects from documents. This understanding will then be layered onto the hierarchy of the organization with your supervisors and coworkers and subordinates all bringing their own understanding of the institution, their own understanding of how things work/don't work, and all the fun unwritten and written rules that pervade such situations.

When you join an organization, one of the most important things you can do as a writer is to figure out how things work and how they don't work. Many times this involves a savvy interrogation of the written and unwritten rules, a process that can be daunting. To make sense of all of this, you can append the following suggestions to your existing writing workflow:

INSTITUTIONAL WRITING QUESTIONS

- WHAT AM I BEING ASKED TO DO? WHO IS ASKING?
- WHAT DOES THE DOCUMENT I'M CREATING NORMALLY LOOK LIKE?
- IF I'M CREATING A NEW DOCUMENT, WHO WILL IT NEED TO MAKE HAPPY?
- HOW DOES THE INSTITUTIONAL NORMALLY COMMUNICATE? WHAT VOICE/TERMS ARE USED?
- IS THERE A STYLE GUIDE? DOES IT APPLY TO MY DOCUMENT?

By asking the above questions, you can become more aware of the situation you are writing in with a new institution. In many cases, the secret to effective institutional writing is to simply take things slow. Watch what other people are doing. Think about what they're not doing that you might naturally do in your own writing. Take all of this into account as you slowly learn what is going to work for you as a new hire/member.

SECTION BREAK—INSTITUTIONAL WRITING

1. What are the unwritten rules of communicating as a college student? Why do you think these rules exist?

2. How does your institution express itself? Describe the institutional voice and the way that the institution talks in official channels and social media. For an added challenge, write a new text using this voice to announce an event or special occasion.

CHAPTER THREE:

VISUAL COMMUNICATION & TECHNICAL WRITING

In our third chapter, we're going to be looking at the visual side of technical writing. It may seem a bit unusual that in a text on writing that we are going to be spending an entire chapter on visual design, but more and more the visual design of technical documents has become increasingly important for authors and users. With that said, this is not document design—we will be talking about document design in the next chapter, and document design is as important as visual design. In some ways they are the same sort of process, but for our purposes we're going to talk about visual design first before diving into document design. To differentiate between the two, consider visual design anything that is primarily visual in nature added to a text—a graphic, an image, etc. Document design, on the other hand, is the visual nature of the text itself—the formatting, the colors, the paper, etc.

One advantage that we have over past practitioners of technical writing is that we can actually spend time on visual communication and carry it out without years of practice working on our skills at actually drawing the visuals we want to use. Desktop publishing technology has entirely changed the way visual design happens in technical communication over the last three decades by giving almost anyone the ability to design competent visuals. In the last several years, with the boom in infographics and other design-heavy presentations of data, this process has only gotten easier and more friendly to newcomers, all the while become more advanced and powerful for those willing to put in the time to truly manipulate data and design.

In addition, many technical deliverables are found in electronic form first, print form second. The advantage of this change in format conveys to visual design can't be understated. Printing in color, especially vibrant and heavily colored texts, isn't cheap (though it has gotten markedly cheaper and more accessible). Designing for the screen first grants us much more freedom to use visuals that have a robust palette of colors to indicate any amount of information—though if our text will also be printed in black and white it can add in new challenges.

WHY DOES VISUAL DESIGN MATTER?

One question that may be on your mind as you read this chapter intro is simply, why does visual design matter in technical writing? The answer is all around us really—more and more of our communication is visual. Think about how much time we spend on computers of any format—mostly phones these days. These devices are often almost entirely visual—there is very little tactile feedback outside of vibration.

Concurrent with this rise in the visual is the rise in the prestige of certain visual designs. It isn't enough to have a phone—you need a phone looks awesome. Sometimes, even the manufacturers of these phones get caught up in this, embracing trendy choices without necessarily thinking about the usability of something like a fingerprint sensor on the back of phone or a notch carved out of the top of the screen. This can go even deeper than visuals—think about how small your phone's thickness is compared to a phone from five years ago. I wonder how much more battery life we'd all have if our phones were the same thickness but had the more advanced batteries we use today.

The problem with visual design, as we've hinted at just now, is that what looks good isn't always what works well for users. Too many times a design is created because matches an existing trend or has visual appeal—not because it makes whatever task the visuals are draping easier to perform.

Now, just because visual design can become too central doesn't mean visual design is bad. Visual design is vitally important because there is so much we can say with visuals that we can't say in a compressed space with words. Think about the logo of your university's athletic teams—when you see that logo, you see more than just the letters and images and colors, and what you see is controlled by your circumstance and your situation. In addition to brevity, visual design can also bring clarity. Sometimes you can more clearly see something than you can read about it, especially when you're dealing with a very delicate task like soldering a resistor into just the right place on a circuit board.

Visuals can also have an ethical case—some folks can't read or can't read the language that your text has been written in. With the use of visuals, you can make it more likely that someone will be able to understand your text and act accordingly. If you doubt the usefulness of visuals that work across cultures and languages, you've never had to go the restroom badly while visiting a country where you don't speak the language.

HOW DOES VISUAL COMMUNICATION WORK?

When we use visual communication, something happens that allows us to see the visual as more than a simple collection of different components—we don't see a visual, we see the rhetoric embodied by the visual. As hinted at earlier with our sports team example, visuals don't function as individual parts or even as a simple sum of their individual parts. Visuals operate using complex rhetorical systems that we'll be referring to from this point onward as visual conventions.

A RHETORICAL ASIDE

Now, before we go further we should probably take a moment and unpack the whole idea of rhetoric. Much like our usage of technical writing, rhetoric is a term that means a lot to a lot of people. By many definitions this entire textbook is a book about rhetoric, though I've not chosen to make rhetoric the term that we use over and over again to talk about what we're doing. Rhetoric is, in our terms, the available means of persuasion in a given situation. If there isn't any room for persuasion in a situation, there isn't any room for rhetoric either.

To unpack this definition, rhetoric is looking for points where you can work to bring others around to your way of looking at things, or at least the point of view or information you're advocating for. Parents use rhetoric when they attempt to convince kids to eat a new food: "It tastes just like those tacos we had last week!" Razor manufacturers use rhetoric to sell their newest blade: "Get an even better shave than ever before!" Phone designers use rhetoric when they pitch something as the newest, the best, or as "magical."

In each of these cases, rhetoric is the identification of the audience, of what that audience values, of how the message will impact the audience, and then ideally the use of that information to create something that will appeal to the user/reader/hearer. Sounds a lot like our second chapter, doesn't it? Thinking about the examples above, the parent is using their knowledge of the child's appreciation of tacos to make a favorable comparison, to re-write the way the child sees a dish. The shaving example playing off the doubts you may have about your current shave—could it be better? The phone design is playing on your desire to have the best, the brightest, the shiniest, and to have the prestige (unspo-

ken in this case) of having a device with all of these attributes. Each of these approaches is a rhetorical approach, one based on research and considerable of where a text is going, where it is coming from, and what it is about.

Other definitions of rhetoric you may be more familiar with usually revolve around something being "just rhetoric." These definitions are usually referring rhetoric's role in making a text or idea more palatable, making rhetoric like a costume, a style, or even a seasoning for your text/idea. None of this is wrong, per se, but the focus on rhetoric as window dressing cuts off the most valuable part of what rhetoric brings to the table as a lens to see the world. Rhetoric may be many things, but it excels at helping us think through ideas to make them worthwhile to others.

As I noted earlier, much of our text is based on rhetoric, though we've not been using the term directly. As someone who was schooled in rhetoric from start to finish in my doctoral training, the approach is the most fundamental one I can imagine. With that said, rhetoric is a very broad field of study with any number of applications. As such, I use technical writing and technical-writing-based terms to discuss much of the content of this text. Audience analysis is very much rhetorical analysis, but I prefer audience analysis because it hews closer to the technical and the formulation makes us more aware of the transactional nature of our writing. We could use rhetoric, but that is a broader term and for our case I prefer the more focused one.

Having said all of that, visual rhetoric really is the best term for what we're discussing right now because it gets at exactly what we're talking about. We are looking at the available means of persuasion in the visual arena, looking at what visuals mean, what they do, and where the come from, and how we can use them to persuade and educate.

BACK TO VISUAL COMMUNICATION—HOW DOES IT WORK?

Much of the approach we'll be using in this chapter involves visual conventions, a rhetorical concept developed by Charles Kostelnick and Michael Hassett in their book Shaping Information: The Rhetoric of Visual Conventions (2003). For Kostelnick and Hassett, visual conventions are an inherently rhetorical communication style that relies on a bevy of hidden conventions and histories to make sense, conventions that will change and evolve over time, rising and falling in response to the course of history. Their book is awesome and I recommend it to anyone and everyone who does visual design.

With any given visual design, what matters are the visual conventions that the design creates, redefines, integrates, or ignores. These visual conventions are choices in the design process that have come to mean something to certain folks (sometimes even meaning different things to different people). These visual conventions have rhetorical effects—they move people to understand things a certain way, to treat information a certain way, and to see visuals as conveying a certain type of information or a certain type of authority or association.

Sometimes a visual convention's meaning is mandated—think about the road sign that you follow on any given drive. There aren't really options when it comes to depicting the speed limit of a given stretch of road—the design is a convention that is used over and over again across the country. In each case when you see the speed limit sign, the combination of the white color, the shape of the

sign, and the font and wording on the sign all signal to you that this is an official government sign informing you of the expected limit to your vehicle's speed on this stretch of road. Sometimes the placement can vary to make the sign less effective for drivers (though perhaps more effective for officers giving tickets), but the sign always means the same thing because of the power of the visual convention and because of the various laws and ordinances preventing competition with other designs and information. In the case of these signs, the rhetorical weight of the national or state government is behind each visual because of the associations with that government and the interactions those signs can prompt with law enforcement because of their correlation with state and federal laws.

In other cases, a visual design can be subject to tweaking and manipulation. Think about the veritable industry that has popped up over the last several years drawing on t-shirt mashups of various fandoms. The designs in those shirts often play on potentially obscure mashups of different elements of pop culture fandoms, creating a shirt that is quite meaningful to those that get the reference.

Wearing a shirt with visual references is a rhetorical move—you're showing those around you, or making the claim, that you are a part of a particular group with a particular mindset. When you put on an "I'm With Her" t-shirt or a "Make American Great Again" hat—you bring with you everything that anyone has ever associated with those visuals and invite classification of your political preferences. In fact, the power of political clothing in particular is something so great that it has spawned numerous laws and lawsuits related to voting and voter intimidation.

As you may be aware, or not, the printed page is also a visual convention, a bit of visual rhetoric. When you see a printed page with black text and white paper and clear margins on each of the four sides, you realize you are reading a printed page. That, in and of itself, has implications! How many documents have you not read simply because they looked like a printed page rather than something more interesting or quickly readable? Visual rhetoric gets complicated quickly.

SECTION BREAK—VISUAL CONVENTIONS

1. What visual conventions are found on your campus? What do they signify and how are they specific to your campus?
2. Are there any visual conventions you've ever misunderstood for any period of time? What were they and why?
3. What types of visual conventions immediately turn off your interest? Why do you think that is? What are these conventions saying to you that immediately makes you lack interest?

USING VISUAL CONVENTIONS

As technical writers, we want to ask ourselves—what do we need to convey visually in this situation? The question of how to convey something visually can get complex quickly due to the multitude of factors that impact how a visual is interpreted. To navigate the process effectively, you need to ask the right questions and identify the issues that may pop up with your visual choices. There are risks and rewards to using visuals heavily in a text, and the risks can multiply as you lean harder into your visuals to carry the weight of your meaning. Too many references, too many meanings, and your visuals can become more complicated than a word-based text!

When you go to design visuals, try starting with the workflow/questions below to guide your visual design and thought process:

DRAFTING VISUAL RHETORIC

1. WHAT IS THE GOAL/PURPOSE OF THE VISUAL?
2. WHAT NEEDS TO BE CONVEYED?
3. WHO WILL BE THE AUDIENCE AND WHAT VISUALS WILL THEY RECOGNIZE?
4. ARE THERE ANY VISUALS THAT COULD BE ALTERED OR INTEGRATED TO FIT THE PURPOSE?
5. WHAT WILL THE VISUAL LOOK LIKE?—DRAFT IT.
6. WHAT ASSOCIATIONS, GOOD AND BAD, COME WITH THE VISUALS?
7. WHAT LEGAL GUIDELINES, IF ANY, IMPACT THE VISUALS?
8. WILL THIS VISUAL BE UNDERSTOOD, OR WILL IT NEED TO BE EXPLAINED?
9. FINISH IT OR RETURN TO A PREVIOUS PHASE.

1) What is the goal/purpose?
First off, you need to decide your purpose and goal for the visual. If the visual is a stand-alone document, then this process is much more involved. If the visual is a part of a larger document, or a single document that is part of a larger campaign, then you often have less work before you when it comes to deciding what your goal and purpose are.

The goal and purpose are going to be guiding principles for you, just like with the drafting process. You need to make sure that you keep your goal and principle in mind always—they are the rubric that you will use to grade your work and that you will use to judge the choices that are available. Never allow your design to take control of your drafting process! Your purpose is what matters—not the awesomeness of the design. There are a lot of awesome looking designs out there that are absolutely awful documents or experiences because the folks creating them became so enamored of their visual design that they forgot that people had to actually use the text. To quote Dr. Ian Malcolm, "[they] were so preoccupied with whether or not they could that they didn't stop to think if they should."

2) What needs to be conveyed?
Going along with the question of purpose, we need to figure out what exactly the visual is going to be doing—what is it going to convey? To answer this question, you need to ask whether the visual will be carrying all of the weight or simply part of the weight of your project. If it is the sole document, then it will convey all of your information. If it is part of a document…well…you get the picture. Make a list of everything the visual needs to convey, and then run that list by your purpose

and weed out things that don't fit the criteria of your purpose.

Once you have an idea of what you'll be conveying, try to get specific. What particular values are going to be conveyed? What specific data? Go beyond simple typology and get into how much data will be there and what format it will have. These considerations matter a great deal. During this process don't be afraid to doubt the creation of your text—sometimes a visual needs help and that is okay.

3)Who will be the audience and what will they recognize?
Once you have an idea of what information you should be conveying and your purpose, you need to run this all past your audience and what they're going to need and understand. This might seem a bit backwards, but you want to at least have a firm idea of your own goals before you hit the audience angle. You don't want to have this project/visual spiral out of control.

At this point, you may need to add some information if your audience needs some help—that is alright. But, always keep your purpose in mind. Your text doesn't need to do everything your audience could ever desire and want. It needs to complete the goals you've set for it. Sometimes you need to expand what you thought the text would be to do that, but you make that expansion with your goals and purpose in mind!

If you realize that your audience may need more than your purpose allows, you have some hard conversations ahead potentially. When you want to make a project bigger, there are often institutional concerns about mission creep—letting a project grow until it basically can do anything and everything. More often than not, good projects do one thing well rather attempting to do all the things. As such, organizations can be—rightfully so many times—opposed to expanding what a document is supposed to do. If you feel strongly that a text needs to be expanded, make sure to couch your conversation in language that serves your organization—show them how this is going to help them too.

When it comes to what your audience will recognize, you're going to be thinking about what you can rely on without explanation and what you can rely on with explanation. Most folks understand what a stop sign is, but not everyone can quickly read the chemical hazard sign that you find on the doors of laboratories with dangerous chemicals inside. That's okay. Part of your visual design at times should be an explanation of the design itself—that is what a key on a map is for after all.

4)Are there any visuals that could be altered or integrated for the purpose?
Once you know who your audience will be and what they will recognize, you can move along to the next phase and decide what visual conventions could be altered or used for your purpose.

In some cases, you can quickly alter a visual to make something visible. You might, for example, take a generic soccer jersey shape and then use that shape as a frame in Illustrator with a nation's flag underneath. The end result is a quickly-made graphical representation of a national soccer team. In this case, you've identified two visuals that make sense to your audience/user—the national flag and the soccer jersey. Combining the two is fairly seamless and with the right context (such as a poster title referencing the beautiful game) the visuals should fit right in and explain things visually at a glance.

The goal here is to identify what visuals would be useful, or to create some visuals to be useful. You

can mashup various conventions to make one whole convention, or you can rely on a single convention or two to make things work. Don't think about this as a close-ended process; this stage is all about coming up with ideas.

Create a list as you work of what conventions might work or might be modified to fit your needs. If you want, jot down some notes as to why you've chosen this convention and how it might work/integrate with your purpose, audience, or content.

5) What will the visual look like?—Draft it!
For the next phase, you'll want to take all of your information and come up with at least one or two drafts of what your visual could look like. One thing that may be helpful as you go through this process is to get all of your data into one place where you can reference it clearly. A table can often help for these purposes:

PURPOSE AND GOALS	CONTENTS	AUDIENCE AND AUDIENCE KNOWLEDGE	POSSIBLE CONVENTIONS	COMBINED CONVENTIONS/FINAL VISUAL IDEAS

With a table like the one above, you can see your information and make connections across the matrix you've created. This can be extremely helpful in group writing situations and can help you see/make connections that you might not make or see when you're simply referencing a list or talking out loud.
After you've gotten some ideas together, sketch them out. Don't spend a ton of time on polishing your concept though—you want to make sure this is something you can/should stick with!

6) What associations, good and bad, come with the visuals?
Next, you want to take stock of your visuals and what they connote. This may be something you've been doing all along, but sometimes you can include some imagery without critically engaging with what that will mean and say to others.

In this phase, take a hard look at your visual drafts. What are they saying? What type of message is being conveyed? Does this align with your purpose and your content and your public image? If not, you may need to make some changes. Your audience is crucial in this phase—you might even want to reach out to some testers and get some feedback from the audience you are targeting. There could be positive, negative, or political associations with some of the visual conventions you've chosen without you having realized the connections that exist! Just because you don't see them doesn't mean

you'll not get implicated in any mishaps.

For example, you may have chosen a shade of red that is associated with a major rival of the flagship state university's football team. You likely wouldn't want to have that color associated with your project, especially during a tense football season. But, if you're not huge football fans, you might not realize that a connection exists. Getting some outside feedback can be really helpful when you're figuring out what exactly your visual conventions may be saying. Don't be Picard on Risa with a horga'hn.

7)Will this visual be understood, or will it need to be explained?
Next, you'll want to make sure your visual can be understood, or if it can't be understood that you provide interpretation. If your entire visual is difficult to understand, you'll likely need to revert to a previous phase of development. There isn't much use in creating an entirely novel set of conventions that require painstaking explanations. (Sure, you can make some what-about cases, but for the most part entirely novel designs that make sense to no one are a bad idea).

As you consider your visuals, run past what you're conveying and what your purpose is and combine that with your audience. Where are the gaps that might appear? Once you've identified those gaps, create some explanations to help guide the user. If the gaps can't be bridged, redesign!

For example, you might be using the soccer jersey with national flag example from earlier in an infographic. In addition to the jersey, you might also be including soccer balls that represent 500 people in order to create an infographic about the average attendance of home games for the national team. In the case of the ball and the 500 people, there is not a direct visual convention that exists. No one that I'm aware of naturally associates 500 people with an icon of a soccer ball. Since that is the case, you'll want to label this aspect of your visual accordingly, teaching your reader that the value of a single soccer ball in your visual is 500 people in attendance.

8)What legal guidelines, if any, impact the visuals?
This step comes late in the process, though depending on the field you're working in, it might need to come earlier. In this phase, we're going to basically be assessing the legal guidelines that impact our text in one way or another.

You may primarily want to think about copyright here—visual design is an area that has lots of tangles that you can get into. You can't simply use the Nike swoosh and think everything is going to be okay. Make sure that you have the rights to the visuals that you will be using!

Go through your visuals—are there any copyrighted or trademarked aspects that you're using? Do you own those or have permission for their use? If you don't, see if you want to take the trouble to get the visuals or if you simply need to design around the issue. Be warned—if you are using parody or satire, you can still end up in a legal battle.

9)Finish it up or return to a previous phase
Once you've finished the previous steps, you should have a final candidate and be confident in the candidate's effectiveness and legality. In that case, put some final polish onto the design and get it ready to go. If, however, you're not happy with what you've found yourself with, take some time to

go back in the design process.

SECTION BREAK—VISUALS AND PRODUCTION

1. What are the iconic visuals associated with your institution? How are they protected? How are they parodied or used by 3rd parties?
2. What conventions are protected by regulation in your major area of study due to their importance?

SIGNS, SAFETY, AND VISUAL RHETORIC

When you're working with visuals and visual communication, one important aspect of this type of work to keep in mind is the presence of safety and warning signage and their associated conventions and representations. As with any type of visual rhetoric, there are conventions that will come into play and conventions that can be flouted or adapted. Think about this section as an extended addendum to the previous, one that goes over a few issues that are of note when we're working with visual conventions and rhetoric that involve safety and signage.

WARNINGS AND COLOR SYSTEMS

One ever-present part of almost any instruction manual or poster is the warning and caution system. These warning systems are so regular for some of us that we almost ignore/internalize them, but they are worth focusing on specifically as technical writers. When you have any sort of technical process, you have some aspects of that process that are more dangerous or more important than others. You may have some steps, for example, that are particularly troublesome or have just historically caused issues (even if you wouldn't think they would—people are weird). In those cases, you may need a warning note or signage.

Coloration is one important part of warnings and cautions. When we think about the Western use of such colors, we often resort to the colors red and yellow for our work—these colors map onto our streetlights and are used in any number of areas. The visual rhetoric behind these choices is fairly universal—when you see red, you're expected to stop or expect some serious consequences that should be avoided or that you should be made aware of. When you see yellow, you're going to expect to slow down or realize that there is a particularly tricky step or issue about to happen. In each case, color gets recognized before the text.

Even though we use color, we should be aware that all colors don't mean the same thing in all situations and cultures. Colors that have one association in the United States may have entirely different meanings in other cultures! Part of understanding how to use colors in signage and visual rhetoric is to understand the meaning behind your choices or the meanings you're trying to connect to your choices (which we'll focus on more in document design). For example, Halloween is my favorite holiday of all time, but it is a holiday that isn't universal. Invoking Halloween with orange and black won't work everywhere because the tradition is not one that is immediately apparent to some groups.

WARNINGS AND SIGNAGE CONVENTIONS

When we create any sort of visual rhetoric that is designed to warn or caution folks, first and fore

more realize that these signs often have mandated rules and regulations behind them. You don't simply create your own chemical safety poster/signage—you use the mandated and approved signage. These mandates are important because the diverse groups may need to use them quickly, such as first-responders going through a burning building. The flexibility of some visual rhetorical choices is limited simply because more flexibility would introduce the chance that misunderstandings could happen.

As a brief aside, this is also true of auditory warnings. A few years ago a film got into trouble for using the Emergency Broadcast System tone for a trailer. You simply can't do that—it is illegal. The whole goal of that tone is to prepare citizens for emergency information. If it was allowed in any other case, it would lose its value. Because of that, it is protected vigorously.

DEVELOPING VISUAL RHETORIC FOR SAFETY WITH SIGNS

For our purposes, we need to be acutely aware of what existing laws apply to any signage that we might use. While it may be amusing to read those faux signs that warn something akin to, "If you touch this, it will kill you and it will hurt the whole time," there are many times government or institution-mandated choices that have been made for us already.

For signs that involve harm to the process being carried out or to individuals, we can follow a fairly direct workflow, in addition to what is noted above:

SIGNS AND SAFETY WORKFLOW

1) What are the dangers of this task?
    a. To people
    b. To property
    c. To other stuff™
2) What needs to be communicated to folks involved?
3)What official signage already exists?
4) What signage exists that covers similar territory that could be adapted?
5) What legal or regulatory constraints control the signage or its presence?

1) What are the dangers of this task?

First and foremost, establish what dangers exist. You want to first of all know if someone might become injured or perhaps even lose their life. You also want to know how something could be damaged, potentially catastrophically. Finally, think about the types of dangers that exist that aren't necessarily either—such as risks to appearance or reputation or relationships. (Medical records are private for these exact reasons.)

2) What needs to be communicated to the folks involved?

There is a difference between knowing what is dangerous and knowing what someone needs to know. Figure out what someone must know about the situation. It might be that there is a live wire involved. It could be that installing a certain part is a one-way process that can't be reversed. It could be that no lifeguard is present. It depends really. But, figure out what is absolutely needed.

3) What official signage exists?
If something official exists, you'll need to use it. Find out what examples are out there and what templates you can use. In some cases, you need a specific sign, such as with material labeling.

4) What signage exists that covers similar territory that could be adapted?
Because of the way that visual conventions work, you may have something that exists out there that you can adapt. If there is a common way of signaling something that isn't legally mandated, you can draw on your audience's knowledge of that format to get your point across. The same is true if there is an institutional equivalent that is often used in these situations.

5) What legal or regulatory constraints control the signage or its presence?
In some cases, you may have some legal rules around when signs must be present, though the signs may not be mandated to have a particular design. You need to be aware of those needs and design accordingly. For example, theme parks have ride-heights that are enforced via signage. The conventions vary between parks, but they are regulated to prevent accident and injury and are often easily understood by audiences because of their shared visual conventions.

THE VISUAL RHETORIC OF CONTEXT WITH SIGNAGE

When it comes to creating signs in particular, think about the users that will encounter those signs. As with the above section, think of this as a focused addendum to the visual rhetoric drafting process from earlier. Signs should rely on visuals that make sense to readers within the context they are deployed. Signs, more than any other type of visual rhetoric, relay information with visual shorthand. Too much information and a sign is useless, or it becomes an infographic or directory or map. Too little information in a sign and ambiguity and confusion reign.

SIGNS AND THE POWER OF CONTEXT

Think about the signage in a library, such as the library I'm drafting this text in. Library signage can do things that other signs can't because of the way that we read them. In a library, we're expecting to find things in the way that you find them in a library. For some collections, that means the Dewey Decimal System or whatever equivalent might exist. In other situations, it means alphabetical listings. In either case, signs in the library can reference alphabetical lists or a numerical reference system without explanation because the situation of the library explains what those elements mean:

A SIGN FROM THE LIBRARY

Take the example sign above—You have 7 major areas that are conveying information to the audience/user. You have a major block at the type labeled "Large Print." This block, from the context, we would assume refers to large print books. There really aren't a lot of other options in a library for this to have another meaning! Below that are two large blue blocks, each with arrows within them and smaller blocks as well. The arrows, from the context, we interpret as one side or another of the bookshelf. The arrows function that way from the context—there isn't room for much else to make sense. Finally, there is the smaller box that starts with one short snippet and ends with another, such as the amusing choice of "Sad-Tru." Because the context of the library, we can understand these terms to likely reference alphabetical ordering. If we want something that falls between "sad" and "tru" in the alphabet, we'll look on the left side of the shelf. If we want something beyond, we'll need to look at the other side or further along.

For your own work, think about context. What can someone be expected to know? What will they not know? What visuals will make sense within this context? Which won't?

SECTION BREAK—SIGNS AND CONVENTIONS

1. What are some signs that rely heavily on location for meaning? How does the association work?
2. What are some examples of excellent signs? Why are they great?

DATA VISUALIZATION AND INFOGRAPHICS

When we think about visual rhetoric, one of the most iconic tasks we associate visuals with is the graphical display of information. Visual representations of data are one of the quickest ways to take something numerical and data-driven and make it digestible to a lay audience. For example, you may not know much about quarterly profits or the levels of methane in the atmosphere, but you can understand a trend line on a chart showing these figures rising and falling. Visualizations of data are powerful, and potentially perilous on ethical grounds.

WHAT IS DATA VISUALIZATION?

Data visualization is at its heart a fairly simple task—you take data and you represent it in a visual format, often in the form of a chart. Now, if you are like most people, the idea of working with charts does not exactly get your blood pumping. I think that is a natural reaction, perhaps even a healthy one considering the state of most charts out there. But, it doesn't have to be so boring and dull. Data visualization can be one of the most engaging and useful parts of your work in technical writing and an essential tool in communicating complex information to others.

We tend to think of data visualization hand-in-hand with charts because charts have traditionally been the name of the game for most folks, historically speaking. Until the relatively recent creation of powerful and accessible data visualization software that laypeople can use successfully with little training, simple charts were the most accessible option for sharing data visualizations because they often had to be drawn by hand or with tedious software. With the rise of more and more software tools to craft visuals and design texts, data visualization has changed dramatically in a short amount of time. For example, infographics are a type of data visualization that have existed in one form or another for a good while, but they have seen an astounding burst of popularity in the last several

years, likely due to the confluence of easier-to-use tools for their creation and low-cost/high-traffic venues for sharing them: social media and websites.

At its core, data visualization is a process of translation more than anything else. Much like the standard definition of technical writing that we started with early in the course, data visualization takes a piece of data and then passes it on to a new audience, making choices along the way of how to present that data and which parts of that data to make more visible and which parts to make less visible or to omit altogether. For example, you might have a dataset that includes information on fifteen different criteria about different institutions of higher education in your state, but you may create a chart that only displays three of them together to make an argument about how the three are interrelated or dependent on each other or to simply show a huge disparity between institutions. The entire dataset doesn't always come through into the visualization, and even if it does, it will be altered in some way by the shift from text/number to visual.
Now, you may have paused briefly at what I just said—shouldn't data visualization just be about numbers? Why would we want to talk about text? Well, thinking that data visualization is just about numbers is a mistake, one that limits our understanding of the power and flexibility of visualizations. For example, I could have a dataset that lists the colors used by a college athletics team since its inception. This dataset likely includes color swatches, perhaps color codes, and will also contain dates for the usage of these colors and perhaps even imagery demonstrating the jerseys that the colors would used on during any given time period. Notice that most of this dataset is not actually numbers. A good bit of it is going to be visual already! From this information I could create a timeline that shows the evolution of jersey design and coloration, or I could create a pie-chart that shows how much of the team's existence is devoted to each particular color choice, or I could do something else entirely. Data visualization doesn't have to be about taking numbers and turning them into images; visualizing any sort of data counts!

DATA VISUALIZATION, EDUCATION, PERSUASION, AND DISCOVERY

When we think about data visualization, we must keep in mind that we're working with a particular goal in mind (at least, I hope we are) to either persuade or educate our readers about something in our original dataset. (Now, that isn't to say this is a definitive list of stuff we can do, but let's keep it simple for our purposes). In each of these cases, we may actually find ourselves doing even more than simply educating or persuading—we may end up learning things we didn't set out to learn.

When we work to educate or persuade with data, we're making editorial choices, choices that we've discussed above. We situate ourselves, our audience, our goals, and the dataset. We try to figure out what particular part of the dataset needs to be visualized and how that visualization will work. This may sound familiar, and it really does align almost one-to-one with our visual rhetoric workflow above. The key here is that we need to think about our dataset and what we need to pull out of it—what will be of use for our users and our context? Once we figure that out, we need to see how that can be carried out in a way that is clear and that doesn't mislead.

Going about the work of figuring out how to share information visually can lead to unexpected discoveries, and that is part of the beauty of data visualization. The approach can be used to share information, but it also has a strong role in invention. You may be wanting to simply relay the growth of different categories of students at your university, but in that process you realize that while

all groups are getting larger, the rate at which they are growing is different, resulting in some groups actually becoming a smaller percent of the overall student body despite continually getting larger. You wouldn't have started out looking for this, but in the process of crunching all of those numbers into visuals you stumbled upon this information, giving you a new perspective,

When we share visualizations, we're trying to get people to engage with data they might otherwise overlook or ignore. For example, many people take numbers and simply don't hear them as data, but instead hear them as noise or non-meaningful parts of your message. This isn't to say that folks who think numerically don't exist—they do—but, they aren't going to be in the majority as far as I'm aware. The same is true for other datasets—they are often super meaningful to a specific group of folks. What a data visualization does is present the information you are sharing in a new way, giving your readership a new lens to view your data through. In some cases, this can actually cause them to engage with the data when they otherwise wouldn't. In other cases, it may help them see around pre-existing conceptions they have about the data or subject by allowing them to see figures and information they are already familiar with in a new way or with new connections emphasized and old ones deemphasized.

TYPES OF DATA VISUALIZATION

Just like with any other type of visual rhetoric, data visualizations work off of existing visual rhetorical conventions. Often times these are codified into types of charts such as pie charts, scatter plots, bar charts, etc. These types of charts exist because they represent an approach to visualizing data that has a value and a purpose. For example, pie charts show us how much of a whole something occupies. Other more novel designs exist, especially in the realm of infographics, but even those designs often rely on visual conventions from outside sources to make sense.

With charts, we have a powerful tool because most popular types of charts are easily read by the general public. More specialize charts have more specialized audiences, but simple bar charts and line graphs and their companions are found all over and can be easily created with spreadsheet software or design software. The advantage of the popularity of these types is that we don't have to do much work to get across the gist of what we're trying to say—the charts have a built in message. Pie charts, as mentioned above, show us a slice of a pie versus the whole. When you take a dataset and you want to emphasize just how much of the dataset is a certain category of content or just how big a certain group is, a pie chart makes sense. If you want to instead show how five different groups are outclassed by one larger group, you might want to use a bar chart because having the different group next to each other allows for a much easier comparison between them and emphasizes size similarities and differences in ways that a pie chart can't do with much rigor. And the beauty of all of this is that folks already understand how these charts work.

Sometimes, it can be useful to try to get your data into multiple types of charts and graphs, just to see what these types can teach you and show you, but you'll often come to a particular type of graph or chart because it represents something you want to say about your data, something you already know.

With infographics, the conventions and audience understanding can vary wildly depending on how you create your text. An infographic might be made up of a bunch of normal charts with some text

to narrate, but often you find more novel approaches in infographics, approaches that borrow visual conventions from elsewhere to make their point.

For example, if we used our previously mentioned dataset on the color changes in an athletic program's history, we could compare the different colors by the number of wins a team had while wearing them. You see this sometimes with home and away and alternative jerseys in sports discussions. In this case, we would likely want to create a miniature version of the jersey that we could then use to represent a particular amount of wins, perhaps 50 per jersey. Then, we could have a grouping that showed all wins over a certain period of time with each jersey in each particular color representing the amount of wins that occurred in that color. The result would be a block of tiny jerseys that would meld together into chunks, letting us see how stark or not-so-stark the differences in wins were between the colors. In this case we've turned data into a visual, one that borrows the visual convention of the colors and the general jersey design to convey information via a key that each jersey is 50 wins.
Now, the above is just one example of how an infographic might be made—you'll often find that infographics are not as simple as one subject and one visual. There can be any number of charts and unique constructions in a given infographic: the goal of the project will help constrain and guide the choices of what needs to be shown and what doesn't.

BUILDING A WORKFLOW FOR DATA VISUALIZATION AND THE ETHICS OF VISUALS

With data visualization, we can mostly work with the previously discussed workflow on visual rhetoric and visual conventions. When you're identifying what to share and what your goals are, think about which parts of your dataset are going to be shared and why you're doing that sharing. When you think about what an audience can understand, think about the types of charts that could be used or the visual conventions that could be altered to create infographic components.

When visualizing data, one special extra issue stands out—the relative ease of purposefully or accidentally distorting the dataset behind a visual through design choices. When someone looks at our visual, they often do so with very little critical thinking, or at least that is what any number of sources and anecdotes claim. We tend to trust visuals, especially pretty looking visuals that are professional and shiny. This perhaps is part of a larger cultural trend in the US that connects polish and graphical prowess with excellence. (Just think about how much value is placed on the visual appeal of certain brands of phones, for example, rather than their functionality. Think about older looking websites—do you want to give them your credit card?) In addition, realize that visuals operate on the rhetorical idea of synecdoche—the part stands for the whole. When you represent a dataset to someone, they often take that to be the dataset. We really should be more critical I suppose.

When creating data visualizations, we need to ask ourselves: am I making choices that alter the way this data is perceived? You may be using a truncated X or Y axis on a chart to make a point, but that may not be obvious to your readers. In this case, your chart may be showing what looks to be a huge change in figures where one simply doesn't exist. Once you have created a visual, audit it. Get it tested with various users. Make sure that what it is showing and emphasizing can be backed up by the data behind the visual. If the visual can't be backed up by the dataset, you've got a problem.

SECTION BREAK—DATA VISUALIZATIONS

1. One critique of visualizations that is often made is that they simply don't cite their sources. Find five visualizations or infographics and check and see if each has sources. If they do have sources, see if you can locate the cited data.
2. Draft a quick data visualization about something related to your institution. You can often find data related to your institution via the office of institutional research or another similar group. Think about what you want to represent and why. Sketch this out—don't worry about fidelity.

CHAPTER FOUR:

DOCUMENT DESIGN IN TECHNICAL WRITING

In this chapter, we're going to be looking at content in the vast arena of document design. Document design can be an entire course in and of itself (I happen to teach one at the graduate level), but there are certain essential skills in document design that technical and professional writers simply must master to communicate effectively and with purpose. We will cover the essentials of document design, followed by layout in design work, followed by a discussion of typography, and finally a reflection on document design and the signposting we've discussed earlier in the text.

When we talk about document design, realize that we are talking about the way that someone reads our text. The design of a document encourages a reader to view a text a certain way, to navigate a text in a certain way. Sometimes that is done using color. Other times it may be done using layout choices. At the end of the day, we're designing a document to be read a certain way and used a certain way, using design to help align the needs of the user with the text within the document. The best document design syncs up with how the text is designed work and encourages users to navigate the document that way. A well designed document is a joy to use.

DOCUMENT DESIGN ~~ESSENTIALS~~ IS ESSENTIAL

Document design as a component of technical writing continues to push further and further into the forefront of what it means to communicate effectively. Put simply, the bar for what is considered good design has been raised rapidly over the years and the minimum expectations of what a technical writer can do, and the value of being able to create good document designs, have risen. Think about websites, just for an example. How many times have you been hesitant to put your credit card information into a dated looking website? We judge websites, and documents, and the companies and individuals they are associated with, by their design chops.

Much of this rise in importance has gone hand-in-hand with technological advances—something we've discussed previously. Much like with visual design, document design software has developed and proliferated at an astounding rate. From the 1980s through today, the evolution of software and publication options has multiplied considerably, and in the last several years the explosion of design apps on phones and tablets has pushed this trend even further along. With the advent of software like Microsoft Publisher in the 90s, suddenly even small business owners could create their own custom signage, coupons, and brochures—something that we often take for granted today. Yes, the templates and the clip art are comical today, but at the time the software was revolutionary. Combined with the expansion of inkjet printers and eventually color laser printers and the expanding footprint of commercial printing services online and elsewhere, advances in technology and access have made creating and producing attractive documents easier than ever before.

Now, you aren't going to be expected to work at the same level as someone who works primarily as a designer or artist—those folks have entire degrees focusing on the art of typography and drafting and other important skills if you're going to be creating truly unique content as part of a design agency or the like. Instead, we're going to be focusing on using the massive array of tools at our disposal these days to make attractive texts that are well-designed and well written for the context they're going into. In particular, we want to focus on the design choices available to us and how to use those choices with meaning and purpose, not to simply click on buttons until things look nice.

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To help prepare you for your work as a writer that has to keep design in mind concurrently with the usability and appropriateness of their writing, we're going to cover some essential ideas as well as some tips and tricks that make working with highly styled texts much simpler and effective. We'll cover in this introduction to design the research of design, the choice of paper/PDF, discuss styling tools for easy changes to texts, and cover images and accessibility/usability.

DESIGN IS WORK, RESEARCH WORK

Many times when we think of designers, we tend to think of folks who sit around all day dreaming up wonderful designs that are a delight to our senses. We may stereotype these folks as being sensitive, whimsical, and driven by fits and starts of inspiration. Generally speaking, these folks don't exist—and if they do, they don't have steady jobs. Good design, like good technical writing, is a job that is research-driven and process-oriented. Good designers are good researchers that work by process rather than waiting for the mood or inspiration to strike.

The goal of all of this work is to support your design choices, nay even to make those choices, based on the information you have about your goals and your users/audience. If someone wants to know why you used a certain color, you should have an answer that makes sense based on your research and the context. Generally speaking you shouldn't be simply doing design on a whim—there should be a goal with research connecting that goal to your choice. The idea here is that if someone questions your work your time usage, you can explain what happened and why you made the choices you made.

The research for design is pretty much the same research we're doing when we look at the research in the writing process or the design of visuals or data visualizations. In fact, though we're separating each of these into discrete processes to aid in learning the importance of different facets of each of these processes, in practical usage you'll make use of all of these processes together, tailored in a way that fits your personal needs and context. So, when we look at doing research for document design, we'll follow off the information we have on audience and visuals.

The first and most important concern when doing design work is of course your audience—who is going to be using this and who are you actually creating it for? Your internal goals and purpose need to be honored while also adapting your text as much as makes sense to work with the primary folks using what you'll be creating. Each of these groups has information you will need: you will need to know what style is appropriate for your organization and the document you're creating, and you'll need to know what types of styles will be appreciated by your intended readership.

When working internally, you'll primarily need to know if there is a style guide that governs what you're writing. Some organizations have expansive style guides with templates for almost any type of writing you would want to do, right down to putting the company or institutional logo on your polo or company car. Others have much more lax document requirements but extremely specific color and logo expectations. Figure out what is expected or required.

You'll also want to think about the folks who will be using your design—not everyone values the same types of design and deliverables. For example, an ultra-trendy and modern design might not make a lot of sense if you're trying to target senior citizens for a research study or educational oppor-

tunity. In the case of the older demographic, you may want to use styles that are attractive to them. Don't know what those are? Do some original research! (I may have mentioned this a few times, but the last section of the book is chock-full of methods you can use to research audiences and usability). Remember that design isn't universal—it is always situated in culture and individual perceptions. I, for example, roll my eyes when I see rebooted 80s and 90s fashion choices that I thought were awful when I was living in those decades worn by students on campus. I didn't like acid wash jeans then, I don't like them now. Folks view design through their own experiences and their own values.

PAPER, PDF, AND BEYOND

When you're doing document design, an essential choice is the venue for your document. Are you going to be creating something that will be printed? Are you going to be printing something that is in color or black and white? Will this be on the web? Will it be on phones? Will it need to be multilingual? The choices are endless, but you need to know what type of document you're creating!

Practically speaking, you should know fairly early on what will be possible or not possible. If you're doing something for a class, obviously you have more freedom than if you're going to be published a run of 5000 documents that will be printed and delivered to their users. Find out what the goal of your work is and what will be expected.

When it comes to design, the medium matters—some mediums cost more, some allow for more options and design moves, and some present more accessibility barriers than others. For example, electronic documents can be more readable for folks using a screen reader, but only if the document is designed for that usage. In another situation, you might be creating a resume that you know will be photocopied. you'll want the actual text to look nice, but you won't want to use colors that will lose their legibility when they're transferred to a black and white copy.

One final consideration with the medium—color. Be aware, and we'll discuss this more in later sections, that there are different color palettes used for screen and print. Generally speaking, you can get much brighter and more vibrant colors on a screen than you can on the printed page. Now, that's not to say you can't get super-vibrant printed colors—you can—but, these colors often come from special palettes that can be expensive and hard to set up for a production run. The primary two palettes you'll want to know about are CMYK and RGB. CMYK is the set of colors used in most printing and consists of a mixture of cyan, magenta, yellow, and black. You may well have seen these colors in the ink cartridges of a printer. RGB is the set of colors used on screens, and is made up of red, blue, and green. Though it may seem counterintuitive, the smaller selection of colors creates the brighter shades.

If you ignore the question of color, you may end up with unintentionally hilarious or just plain awful results. If a printer is given a document set up for a screen, a document that uses RGB color, then it will perform an on-the-fly correction. This correction isn't going to be perfect and you may end up with a markedly different shade than you originally intended. At the same time, if you don't check that your RGB colors are going to translate to the printed page, you may pass along a digital proof of something that simply can't exist on the printed page without a lot of extra work and equipment. Often software makes use of out-of-gamut warnings or the like to give you this information, but you need to be aware those features exist and matter. (If you're wondering what this looks like in real life,

think about any time you've had a really vibrant picture you've taken on your phone and had printed. It tends to look duller and less colorful when you get it printed, especially in the areas of intense color. This is what happens when you send something out of gamut—the printer will downgrade the colors to fit the available palette, often with dismal results).

STYLING TEXT AND QUALITY OF LIFE

While we are going to be discussing typography and layout in much more detail later in this chapter, I want to spend a brief amount of time early on letting you know about the most powerful and life-changing tool that you may well have been ignoring for most of your academic career—paragraph and character styles.

When you work with a large document, you often want to have a good selection of stylistic choices available to create signposts for your readers in the text. We've discussed this at length earlier in the text, and we're going to be coming back to it later in this section when we look at combining document design with signposting. The end result of this process is that you end up with a lot of text with specifically styled choices, choices that you may well want to edit later in your project! If you've ever spent fifteen minutes changing the font size or weight on a resume that you're tweaking before sending it you, you know just how miserable changing the font choices and design moves in a large document can be. There is, however, a better way.

Paragraph and character styles are tools built into most word processing suites that allow you to markup your text to allow the program to remember what type of styling you want to use for a particular segment of text. This information can relate to spacing, font, color, etc. You may well have noticed this before when using something like Microsoft Word when you see the various styles listed as Heading 1 or Sub-Heading in the top section of the user interface.

By painting a selection of text with one of these styles, you're allowing the document to know that this text has a certain purpose within the text. You may be saying this is a section heading, or it might be a keyword, or it might be a warning. In any case, the text has a label that you will be associating with a design. The magic of these styles, much like the magic of CSS when doing work with HTML, is that the program will always remember the purpose and label of the text, but it will be able to change the style associated with the text anytime you'd like. What you're doing is creating a label that then gets used to selective apply style choices like holding the text. If you decide later to change the font from bold to underlined, you can simply alter the settings for that style and then every single instance of the text that is labeled with that style will be altered. It really is life changing.

When working with a larger document, using styles is almost a necessity and needs to be part of your workflow. Think about what types of text you will need to label for signposting and then create styles for those types in your word processing program or using existing styles as a starting point. By coming up with the styles that you'll need for signposting and design at the start of drafting, you'll be enabling yourself to easily change how the styles work as the document gets longer and more complicated. Suddenly, changing the font on a part of your resume goes from a painstaking process of clicking and dragging over and over again to simply selecting a new font or font permutation via the style settings.

I'm not going to go through the process of telling you how to go about setting up styles in this text—that would be likely a choice that would instantly date this text and the software I'm using. I would instead encourage you to look up the style options for your software of choice. If you're using something like Adobe InDesign or Scribus, the options will be overflowing. If you're using a cloud-based option, you may find significantly less tools available. Do some searching in the online documentation for your software for paragraph and character styles and go from there. When doing so, be aware that usually character styles are simply the characters in the text—not the spacing. Paragraph styles incorporate the style of full paragraphs, including line spacing and page spacing. Character styles tend to overwrite paragraph styles, allowing you to set up a particular font and spacing for your paragraphs and then selectively override the font when you have a single bit of text, such as a keyword, that you need to consistently look different.

IMAGES, VIDEO, ACCESSIBILITY, AND USE

One last important area that we need to cover is the inclusion of images into your documents. Images are more and more common, especially in digital deliverables that don't have to rely on being printed. With the spread of high quality camera and camcorders via smartphones, almost anyone can take a quick photo or video that is impressive in quality versus anything available to the average person in previous decades. (Writing this text is making me feel old). Because of the availability and ease of creating images and video, we see them a lot. But, their uses are not always effective or even legible.

One important aspect of using images is the quality of the image—images are created at a certain level of pixel density and using a particular ratio for the dimensions. Despite what you see on TV, you can't simply yell at a screen with an image to "enhance," and expect magic to happen. The pixels you need to create a more detailed image simply don't exist—they were not recorded when the image was taken or they're not present in the current form of the image. You can't get them back with programming magic, though sometimes you can attempt to extrapolate what they might look like.

For our purposes, you want to make sure that your image is not pixelated and that it will print at a decent quality if you're going to be doing a printed project. Different applications have different needs—you can get away with different densities when printing depending on the size and use of the image. Test out different densities and see how they look. For printing, starting at 300dpi can be useful. And, of course, if you're going for a pixelated look to begin with, that's okay. After all, it wouldn't be a proper picture of Nessie or Bigfoot or a UFO if the image was in focus.

When it comes to images on screens, keep in mind that our desktop or laptop screens and our phones can have drastically different levels of image density. An image that looks awesome zoomed in on a desktop with a dated display will look awful when you zoom in on a mobile device with a high density display. Keep in mind that the size of the image, no matter the medium, needs to be scaled with the quality of image available and the space requirements you have.

When it comes to video, think about your composition and framing. Basically, remember that most people prefer video in landscape format for professional usage. Unless you're composing on Earth 2, please try to hold your phone sideways when you film footage. Just saying.

Images and video also introduce accessibility issues for some readers. To assist these readers, you'll need to give titles and alternative text for each of your images in digital deliverables. This alternative text will allow a screen reader to read to your user whatever you consider to be a good description of the image that you've provided. Usually you want to design your alt text to allow the reader to get from the image whatever you'll be using it for later in the text. If you don't do this extra work, folks with screen readers will have no clue what your images are.

Going along with the question of alternative text is the question of how to title and refer to an image, or a visual, in your document design. Generally speaking, you'll want to give a title to your images in a text that will be referencing them. You may call them Figure 1, or Figure 2, or Image 1, but you'll need to have some form of reference. This allows the reader to understand when you're discussing a particular image, and allows for easy navigation back to an image later on if you reference it again. In some contexts going without labels is preferred, but if you're going to reference an image a lot over the span of several pages, titles can help.

Finally, you want to make sure your image is actually visible and doesn't blend into your text. Often times when you include a photo with a skyline, for example, the edges of the image may tend to bleed towards white due to how the image has been exposed and balanced by your phone or camera. When you place an image like this on a printed page, you end up with a visual that blends into the document itself, creating issues with visibility and crispness. To avoid these issues, you can often using a simple border that is maybe 1 or 2pt in stroke. Something that contrasts with the background of both the image and the page can work—usually black will work. You won't want an overly thick border, but you'll be amazed at how much a simple stroke can change how easy an image is to see and how professional a layout looks.

SECTION BREAK—DOCUMENT DESIGN IS ESSENTIAL

1. When we use colors, we often think in generalities—red, blue, green, etc. When we design with color, we need to think in specifics that will get us the color we want time and time again. Do some research on the color codes associated with iconic brands and institutions you admire. See how many types of codes you can find—CMYK, RGB, Hex, etc.
2. Try out using styles with a simple document. Create a series of headings, sub-headings, and paragraphs with associated styles. Save the text with three different final looks, altering the styles between each version.

LAYOUT AND DOCUMENT DESIGN

On the most global level, document design is all about layout. The design of a document is first and fundamentally controlled by the layout of the text and images on the page. Yes, the size and color of the text matters in how someone reads, as we'll get to in a moment, but layout controls what they encounter and when as they navigate in the traditional top-left corner and over and down manner. (And, if you're writing for languages that are right-to-left, from the top-right corner and over and down). Learning how to use layout to guide/assist readers is a fundamental skill for technical writers.

With that said, most word processing software doesn't really dive into in-depth document design as

part of its core functionality. Instead, we tend to operate in a set of conventional document design presets that govern how we read and write everyday documents. When you open a word processor, you likely have a white page with black text, probably Calibri or Times New Roman or Cambria as your font, and your margins are usually set to 1 inch or so on all sides. When you type, the text fills the whole page until it hits the margin, unless you may use of tools like tabs or lists or indents. This is the world we're used to operating in, and while document design is possible in these types of environments, the freedom to determine layout isn't really baked into the fundamental operation of these traditional word processors. You aren't supposed to have to think about fundamental layout—you're writing.

When we take control of layout, much more is opened up to us. Many times a program truly dedicated to document design will simply open up to a blank page—there will be no places to write, there will no places to insert images. All of the choices are open to you, the designer. This can be a bit overwhelming at first, but you'll come to enjoy the freedom. You can place text boxes to house text, you insert frames for images, or just insert the image into the document and move it around. You can create custom paragraph and text styles as well as object-level styles that govern how and when text and images interact. The amount of choices you have are virtually endless.

Document design programs are designed as sandboxes for the creation of any sort of document you can think of rather than any particular type of document. The amount of choices they provide and the lack of handholding go hand-in-hand with professional work where you want to create your design rather than spend your time undoing someone else's preconceptions of what a design should start with.

This can be a bit overwhelming if you're new to things, and you may try to start reinventing the wheel, creating your own take on a fundamental document type from scratch. Try to resist that urge. If you're creating a document that you've never made before, find some examples of the document in the wild from competitors or internally. Look at what they've done that you like and that you don't like. Figure out which elements work for you, and bring them together in a unique design that borrows from a few different traditions. This is how design works—incrementally and building off older ideas. Sometimes you'll see older content brought back to the forefront as the next new thing. Sometimes you'll see existing content tweaked a bit for a new take on design. Designers tend to work to develop off of what is already here—it is much more rare to create something that is fundamentally unconnected to any previous design. Design is a conversation more than anything, and when you contribute to the conversation you're building on what has already come before.

If you can think of the flavoring you wish to give your design, you often start off in a much better place then simply saying, I'm going to create this type of document. I'll give you an example from my own development as a designer to illustrate this point. When I was a Ph.D. student, I met my future wife and we decided to get married. At the same time we were planning the wedding, I was taking a design studio course over the summer. Neither of us were happy with the traditional wedding program, so I decided—naively—to suggest that I could design it and get it printed at the local printer. At first, this did not work out well at all. I would go to my future wife with a design, and she wouldn't like it. I would go to her with another, and she wouldn't like it. A good part of this was related to my actions—I was trying to create something I had no experience with and with no

conventions to reference. It was awful. This happened for a while before I realized that I didn't need to reinvent the wheel—I simply needed a new paradigm to view what I was doing.

I thought about who we were as a couple and what we had in common in our pasts. Both of us had many friends in theater when we were in college, and we both helped a lot with theater productions. I realized that what we could do was create a wedding program that was designed with the same visual aesthetic as a low-budget college theater's program for a play. Once I had this idea, which my future wife loved, I had a much easier time developing things. I was able to use classic clip art to give it a retro and low budget feel, and I set up the "play" of the wedding as a love story. The exit song and theme of the program was "Ever Ever After," so that tied in nicely. The different parts of the wedding were set up as acts and scenes in the play. Our history as a couple was the summary of the story thus far. And the back page, which I was particularly proud of, was the cast and crew—the wedding party basically—with headshots and short bios about each member and how they connected to the bride or groom. Having the theme, an approach that I could take to reimagine and meld two different types of documents, made all the difference.

So, with your layout work, don't try to start with nothing and create something. Do some research on what is out there. Think about your goals, your audience, the use of your text. Find a thematic that works well and features that you like from elsewhere and blend them together into your own design that speaks in a particular design language that makes sense. As I've mentioned, you see this all the time. Ever noticed how phone design seems to work based off one hit design that gets copied and adapted just because? It works the same with material design and even architecture! Folks doing design operate in existing traditions and expectations. You can get rewarded for something novel, but that is extremely hard to pull off, and often outside the scope of what you need to do in any given project.

To flesh out the rest of our discussion on layout, we're going to cover some fundamental ways of viewing layout and doing layout. We'll look at the basic concept of stacking to create layouts and designs, we'll discuss placement and purpose, we'll discuss legibility and color, and we'll discuss print concerns with layout choices (bleeds and such).

STACKING—THE FUNDAMENTAL DESIGN TOOL

When it comes to doing document design, or any sort of visual design really, the concept of stacking is absolutely central to pulling off virtually any sort of complicated multi-element design. (And, if we're honest, it applies to drawing and painting too, but let's not go too far astray). Stacking is a way of viewing design, one that makes the process of breaking down and then creating or recreating a design much easier than trying to tackle a full image by itself. I'll explain.

Let's start with a terribly-drawn example of a carved pumpkin. I believe I've mentioned that Halloween is my favorite holiday, and thanks to the iPad Pro that I'm working on, I can draw you the world's worst drawing of a pumpkin. (I promise I can do better design work on a pc with a mouse). This example will provide for us both comic relief as well as a brief insight into how stacking can be used to create document design effects when doing layout.

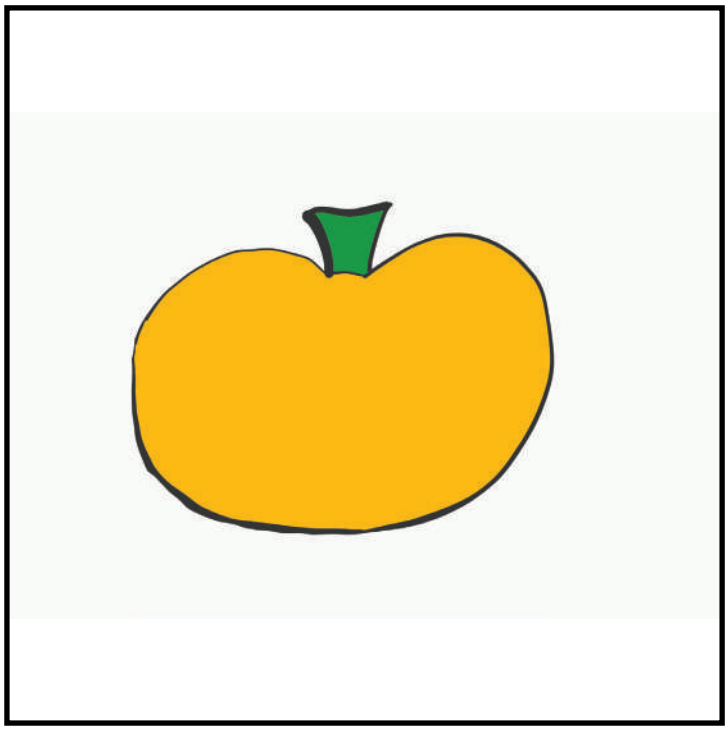
In this image, you see a pumpkin or something that looks like a pumpkin that has been carved for Halloween—but we need to move beyond seeing the image as a single entity to understand how stacking works. Normally, we would view this image as a single visual. The stem, the eyes and mouth, the banding on the body, the outline of the body, and the color of the main body are all seen as one. We need to instead see each of these items as a single entity that has been created through stacking several different elements.

Stacking works in layout and document design fairly simply, much like an old fashioned projector, you layer one visual element on top of another, creating a stacked effect that creates your final product. Crucially, you also operate in a stacking mindset, creating each individual level of elements on their own layer of the image. By breaking down the image into differing layers and stacking those on top of each other, you create a final image.

A BADLY DRAWN JACK-O'-LANTERN

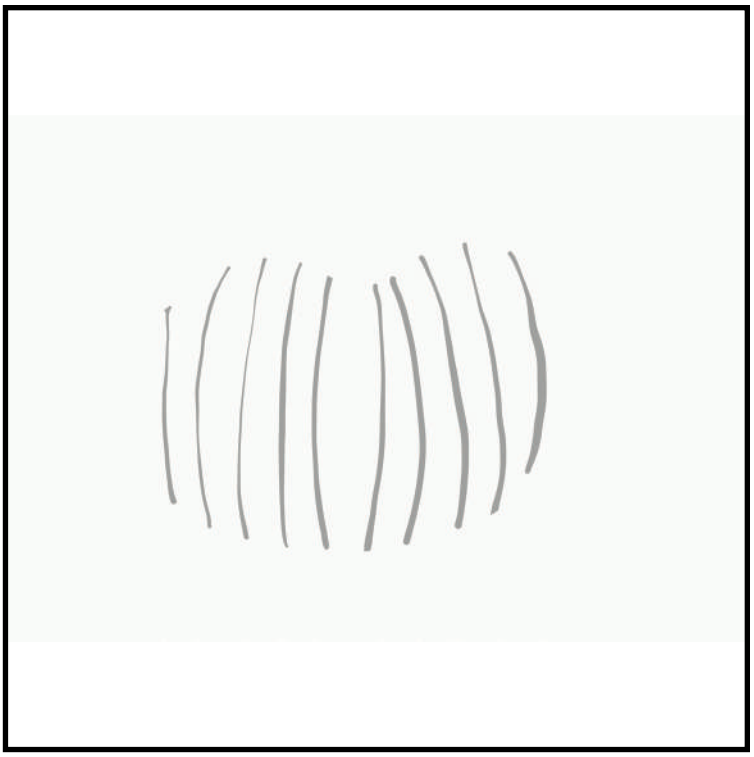
In the example above, we actually have four different layers that are being used. First, we have a background image that is being used. In this case, we have a transparent background, so we can ignore that for now. Next, we have the actual shape of the pumpkin and its outline and stem as you can see on the next page.

This is all that we have on this layer, and if we wanted to be really process-driven, we could have put the stem on a different layer entirely. What this allows is for us to create the basic look and overall shape of our design element without having to worry about other elements.



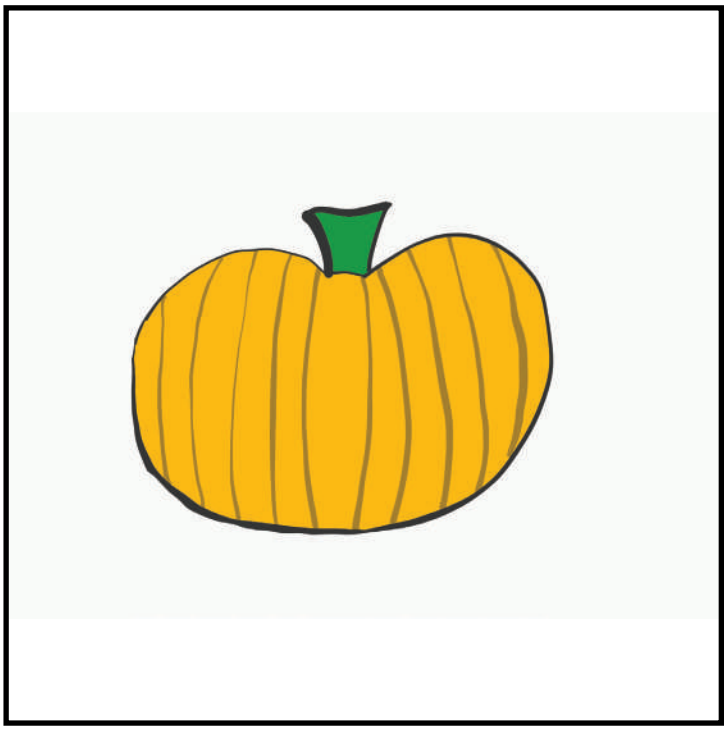
THE BASIC PUMPKIN SHAPE LAYER

Next, you have a layer that consists just of the banding that you see on the pumpkin. In this case, I started with a solid black line stroke and painted that onto the pumpkin body from left to right. Once that was done, I lowered the opacity of the layer so it would be less harsh and look more organic—which I suppose is overkill when you're drawing the world's worst pumpkin carving. Once I was done, I was able to clean up by erasing any strokes that went past the edge of the pumpkin body. Because I was on a totally different layer, I didn't have to worry about erasing any of the pumpkin's body. This is another key advantage to stacking and layer-based design. Here is what this layer looks like alone:



THE PUMPKIN LINE LAYER

Notice that just the lines are visible here. That is all that is operating on this layer. However, due to the way that layers work, I was able to see what was below when I was doing my line insertion. The final product, combining the two layers, can be seen here.



THE PUMPKIN AND LINES COMBINED

Through the use of layering, you can see how the image slowly evolves into something that looks more and more like a terrible pumpkin. The complex design elements (ha!) are layered on top of each other, allowing you to tweak each layer independently without impacting the others.

The final step was to take the eyes and mouth and add them onto the pumpkin. This was, as you might guess, yet another layer that was drawn on top.

As you can see, there is simply a mouth and two eyes here. This was drawn with the advantage of seeing what was going on below, allowing me to line everything up. However, since the elements were all on their own layer, I was able to tweak them, erase the edges as needed, and redo them even without having to worry about the rest of the document getting altered. The end result, which you can see, was far from striking, but it does take advantage of this concept of stacking when doing document design layout.

THE FACE

THE FULL EFFECT

Each stacked element, from bottom to top, blends together in the final image to create a carved pumpkin. Each element is standalone, which means I can tweak the colors and the shapes quickly without having to do much work at all. If I want to have a bright purple pumpkin with a silly face, I can do that by simply repainting the coloration on the pumpkin, making the lines darker, and redrawing the face layer. In less than two minutes, I was able to get just such a result that you can see on the next page.

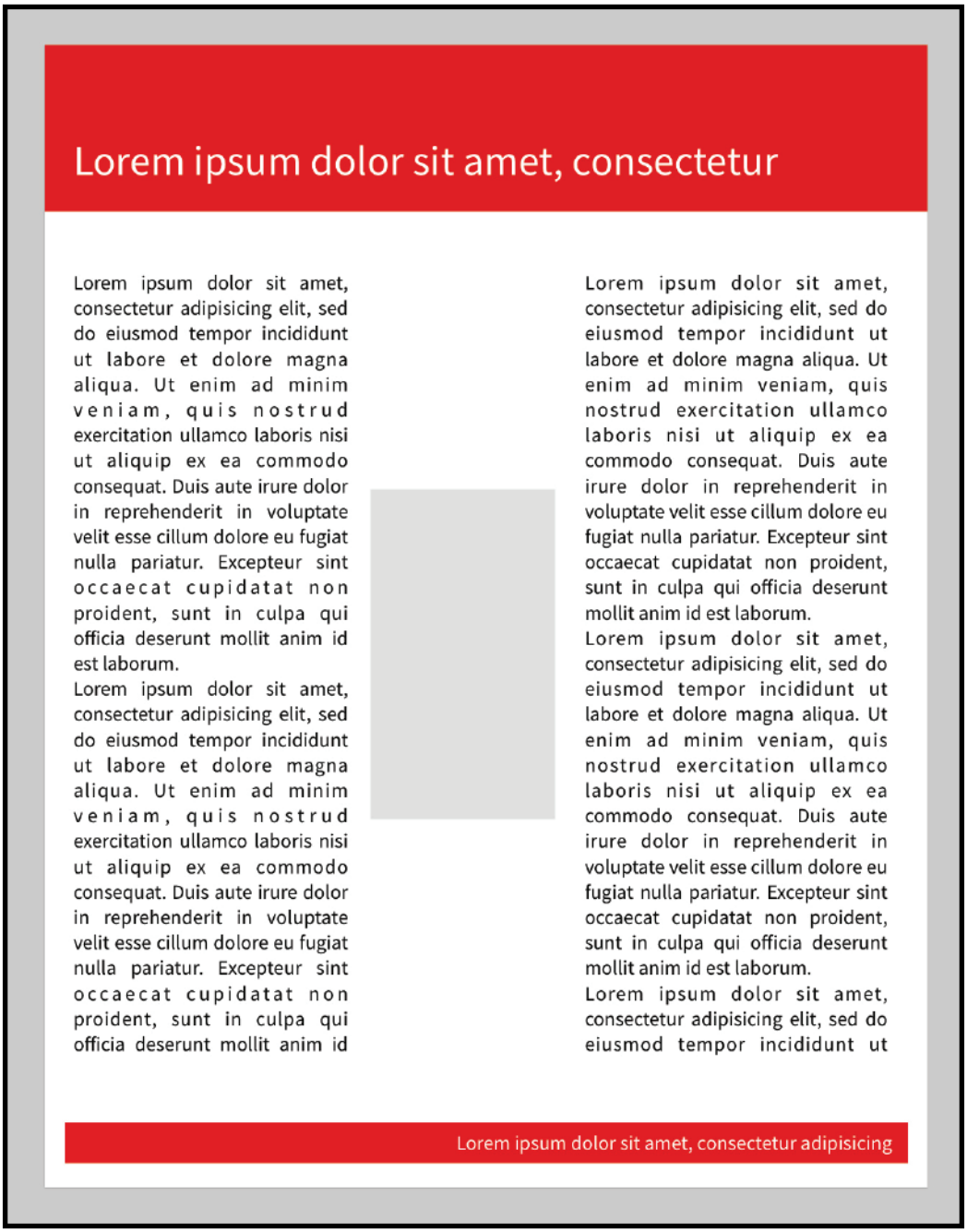
A QUICK DESIGN REMIX

Again, because of the leeway that stacking gives us when doing a design, we can quickly change the elements, move different elements and recolor them quickly, etc. Stacking really is the secret to a good layout! It also helps when you need to replicate something with slightly different looks over and over again. Think about my pumpkins above—I was able to create a basic pumpkin then riff off that design with the same dimensions over and over again, giving me a basic template for future pumpkins that could all fit into the same slot/spot.

Now most of our examples thus far have been with our outrageously bad pumpkin illustration. I started with that type of example because stacking is often the secret to creating complex logo elements and other pieces of technical writing that you may need to create from time to time. But, it also works for standard designs like signs and newsletters. You just need to apply the same paradigm and thought process to your work. Think in layers and stacks and you'll be able to break down virtually any design that you see and replicate it fairly easily. This also gives you any number of ways to find inspiration for a design because you start to see the various elements in the stack rather than the entirety of the image or document. You can borrow a few elements of the stack as inspiration and leave the rest.

Take for another example the newsletter template you'll find below. In this example, you have several

different items stacked in simple layers. The background layer has all of the major color blocks for the header and the footer, then you have text on top of those layers one layer of text for the main text in the body of the newsletter. To create colored segments that are edge-to-edge, you simply need to draw a box or equivalent shape and then color it. That becomes a stand-alone layer and colors that particular part of the layout:



AN EXAMPLE NEWSLETTER TEMPLATE

Here you get the effects of a simply-designed newsletter with a space for a photo in the center and a colored header and footer. A few of the elements could be aligned better, but the overall layout works

as a newsletter. By making use of layers and stacking, you can create virtually any design layout you'd like by breaking down your intended final product into a series of independent layers. And, again, this makes recoloring and movement of elements easy because you're not constantly running into all of the elements at any single time.

SECTION PROJECTS

1. Take a document with a fair level of design applied—visuals and colors and the like. Break it down into a stack that you could reproduce. What elements will be on what level? What order will they be in?
2. Build your own stack—you just need a program that does design in layers. Create a simple graphic using a stack, such as an icon representing a PC. Plan your stack out and then build it.

PLACEMENT AND PURPOSE IN LAYOUT DESIGN

Having looked at stacking, we now need to look at the central move we make when doing document design work—placing elements and using that placement to convey purpose. Whereas stacking is an approach to creating document designs, placement represents a type of choice we make with each individual element in our design. Where we place elements and the relationship of that placement to the whole document and other elements in the document controls the way our text is perceived and navigated.

When we view a traditional document, placement often determines the level of importance that we give to a line of text. Looking at the x-axis of the document, the further left or right an item is placed usually determines the level of importance in the textual hierarchy. If this sounds familiar, it is because we touched on this same issue when we were discussing taxonomies in chapter 1. Generally the closer to the left side of the document, the more importance something is given. The same also holds true to the y-axis: the closer to the top, the more important something is.

As we noted earlier in the taxonomy discussion, placement has a crossover effect—items that are placed in the same way and along the same line on an axis are considered to be of equal importance. If you have three images that are placed side-by-side in the middle of a page, you consider them of equal importance.

Going along with the idea of placement equaling the same value for different items, placement together also creates groups of items, groups that are usually read as being considered one unit to be read together. You see this in many texts where you will have a grouping of images or paragraphs. Each of the paragraphs or images that are placed together are considered to be equal and connected in some way because they share the same placement on a line in the x or y axis. See the example below for what this looks like:

AN EXAMPLE OF GROUPING

In the above example, you have three different images of pumpkins on the same level of the y-axis. Because they are of equal size and on the same line, they are viewed as being of equal value to most readers. If you look at the x-axis alignment of the pumpkin images with the text that is below them, both the text and the image are on the same line of the x-axis. This creates an association that these two items are of equal importance and draws a connection.

In addition to simple alignment along an axis, the relative closeness of two items in a document matters as well. In the pumpkin example, the relative closeness of the text and the images suggests to the

reader that they are part of the same item—they belong together because they are quite close. Each of the pairs is considered to be of equal value because they are on the same line of the y-axis, but they are not considered the same item because they are not quite as close together.

The end result is that we can use placement along an axis to indicate that items are of equal importance, and the relative closeness between two items along an axis to group them together visually, creating a unit within the text on account of the proximity each item has to its companion.

When it comes to placement, do note that subtlety is usually not something to be sought after. What I mean by that is simply that when you want to space items out or want to group them together, don't be amibiguous or subtle. If items are together, place them close to each other. If they are of equal importance, place them along the same line. If they are not together, make sure the distance is great enough that it doesn't appear to be a mistake—very slight variations in distance can be read as mistakes by an author rather than a differentiation between two different images. The same holds true for any types of placement that indicate value or groupings—if you make the differences between groupings or alignments slight, it can and will be read as a mistake. See the image below for an example of this:

AN EXAMPLE OF BAD GROUPING

In this example, you can see that the placement of the left and right pairings of pumpkins is almost exactly along the same line on the y-axis. There really isn't much difference between the two, and there is an awkward gap between them on the x-axis that just sits empty and open. To most readers, this is read as a design mistake because there is a very subtle shift in the placement of the images and a general lack of balance to the placement as well—the large white space doesn't sit well with us.

SUPPLEMENTING PLACEMENT WITH SIZE AND DESIGN ELEMENTS

To fix this, we would likely want to use a different alignment, but we can also supplement our placement using size and other tools. Generally speaking, the size of an item that is placed in a document correlates to importance, just like the size of a font usually connects to the importance of text in a document. In addition, much like with text, we can use lines and other visuals to underscore our choices in the layout placement.

Putting a line between grouped items is the equivalent of a line break or other spacing equivalent in text. The size and placement already indicates a relationship in the layout, but the extra elements underscore this as in the example below:

AN EXAMPLE OF GROUPING WITH SIZE AND LINES

Here we have a massive size difference between the two pumpkin/text groups. On the left we have traditional colors for the pumpkin in a fairly large size. On the right, separated by a black vertical line but still occupying the same line on the y-axis, we have two additional pumpkins. This line exaggerates the importance or at least draws attention to the importance of the size difference and layout

differences between these two groups. It also makes the two groups separate cleanly. The symmetry between the smaller elements size and placement also indicates they are of equal importance, but of less importance than the larger and left-most image and text combination.

SECTION END PROMPTS

1. Take an example designed document and breakdown the layout choices. How are size and placement used to control the navigation of the document? How are groups created and what impact do they have on the text?
2. Create your own layout using simple wire frames to meet a specific purpose, perhaps creating a poster or flyer for an event. Think about how you can use size, placement, grouping, and stacking to indicate intent.
3. Take a layout that works well and break it. Move things in ways that ruin the intended effect. Why do your choices mess things up? What rules are being broken that make things uncomfortable to read or misleading?

LEGIBILITY AND COLOR IN LAYOUT

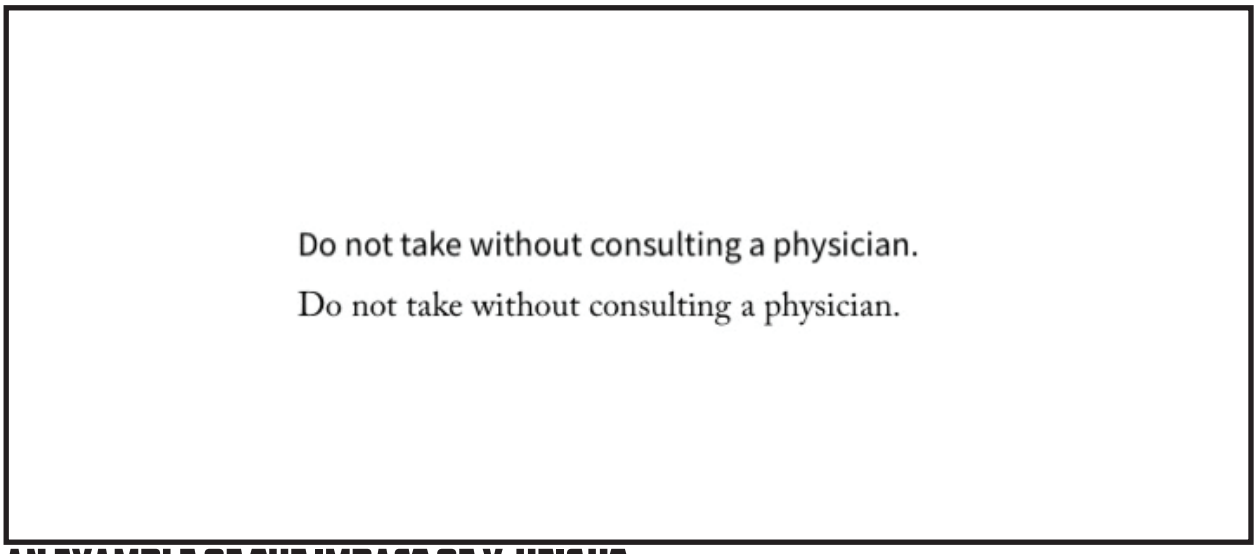
In addition to the placement of the elements of a design and the relative size of elements in a design, we need to consider the relationship the overall legibility of elements and the relationship in particular of legibility to color choices. While you can put a lot of great information into a document, that doesn't matter much if no one can actually read the information that you've placed in the text. Texts can become illegible for a couple of reasons including physical placement, size, and color contrast. We'll spend a little extra time discussing color because uses of color can cause text to be less obvious without necessarily making it fully illegible.

We cover legibility for practical and ethical reasons. If you've ever run into a document that had important information in a place that was hard to find or in a place that didn't allow you to read very easily, you understand the ethical issues with legibility. Sadly, there are some writers out there who have purposefully used the layout and design of their texts to make some information less legible or to hide it altogether. One fundamental question we have to ask ourselves regarding legibility is simply: am I making this text fit at the cost of readability?

One way we need to deal with legibility is just the physical aspects of legibility—where text is on a document and how conducive that placement is to use and reference. In some cases, you may have a text where certain parts of the document simply aren't that useful for prime information. For example, if part of your document could be exposed to excessive wear, you wouldn't want anything important to go in that space. (This might be an issue with a text that has a long life and gets referenced and used continually). You can also have parts of a text hidden by the physical structure of a document—content too close to the spine of a book can be unreadable.

We also want to think about the size of the text that we're placing and how that size impacts readability. When it comes to working with size, we want to be able to balance the overall amount of space that a bit of text is using with the importance of that text, the amount of information that needs to be there, and the legibility of the choices that we're making.

Not all fonts are created equally, as we'll discuss in our next major section on typography. One way we can measure/assess fonts is their relative x-height: the height of a given font's lowercase "x." X-height allows us to assess the general contrast between the height of lower-case and upper-case letters in a particular font. The closer the lower and upper case letters are in height, the more legibility a particular font tends to be at smaller sizes. This isn't universally true—some fonts are just hard to read at small sizes—but, it can be a great rule of thumb. So, if you need a font that will perform at small sizes, find one with a relatively small level of contrast between lower and upper case letters. For an example, see below:



AN EXAMPLE OF THE IMPACT OF X-HEIGHT

Here you have two different fonts, each set at 10pt. Notice that the top example is much easier to read at any level of distance. A major reason for this readability? The x-height.

When we're dealing with text in general, legibility concerns should lead us to try to never go below 10 point sizing. 12 point is a relatively common size for general paragraph text, and while smaller font sizes can be readable in certain contexts, going below 10 can cause issues for some readers. If you simply need more space to convey the information on a given document, you may need to either edit your information for clarity and brevity, or you may need to create a larger document or a supplemental text that can be referenced. (Though, the issue with supplemental texts is that very few of us are going to go out of our way to find and read them).

As a secondary issue related to legibility and size, we want to make sure our use of size is is proportional to the importance of a bit of information to our users. We shouldn't go out of our way to make less important information super visible while hiding less important information—to do so is unethical and often causes no amount of frustration with readers. Have you ever gone to the store and seen a special and decided to go ahead and take advantage of it, only to get to the checkout and realize you didn't see the fine print that makes you ineligible to actually get the special price? If so, you've encountered this very issue! Depending on your mood, you may have rewarded the misuse of font sizing by just going ahead and getting the purchase, regardless of the sale price, but if you're annoyed enough you might just abandon your whole purchase. Without naming names, I can tell you

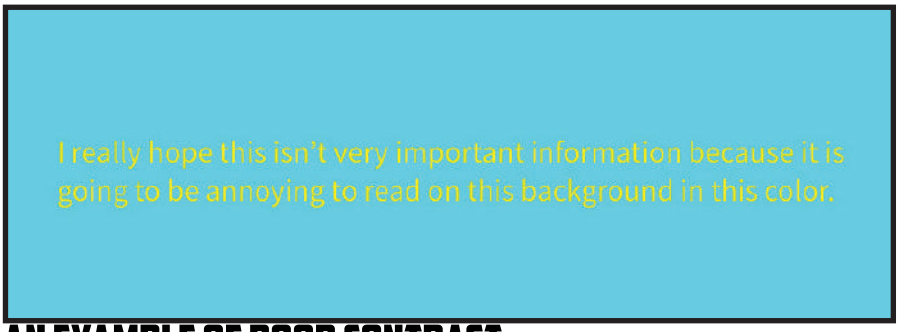
that a certain local retailer with a national footprint has basically turned me off of all of their "buy X and get a gift card for X amount" deals for this exact reason. If I see those signs, I tend to ignore them—I've been mislead too often and I'm too annoyed to mess with them.

To get around issues related to size and importance, simply make sure that any critical information is obvious enough on a quick read. If you've gone out of your way to make a special visible to a reader, make sure any common disqualifications are equally visible, or at least make sure the fact that qualifications exist is very visible. When possible, try to give all information regarding a subject equal billing, that way you don't risk annoying or misleading your readers by gating certain information via sizing. For example, a BOGO (buy one, get one) sale sign that doesn't let you see that the BOGO nets you a 10% discount is deeply frustrating to someone who assumed a second item was free or heavily discounted. In this case, we would want the tail end of the BOGO to show up at the same size as the rest of the text, or at least at a size that allows instant comprehension of the deal. In situations like this, the extra text placement simply makes sense—you can't assess the value of a BOGO offer without the final bit of information.

Having looked at physical placement, font size, and the size/importance connection, we finally need to cover the importance of color in layout legibility and readability. Color can impact the way that we process texts in any number of ways, each worth taking a moment to focus on. First, color can impact overall legibility of text and other elements. It can also impact the way that readers assess a text and associate a text with other information. Finally, color pose an accessibility concern that we need to be aware of.

When thinking about the legibility of a text's layout in regards to color, we want to think about how much contrast is available between a given text and that text's background. The traditional writing arrangement that we see when we fire up a word processor makes optimum usage of contrast by presenting us with a total contrast between a solid white background and solid black text. In a few cases we see this reversed for nighttime reading on a screen with a solid black background and solid white text. Regardless of which is used, the goal for both layouts is an optimum level of contrast. When moving beyond these two choices, we need to make sure our color choices maintain an acceptable color contrast in our layout.

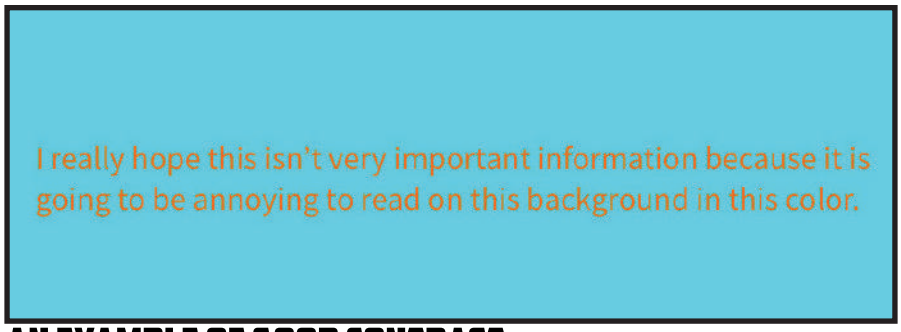
When dealing with contrasting colors, the simple rule of thumb is to choose colors that different in their general darkness or shade—you want a lighter option to contrast with a darker option. Generally speaking, light text and light background shades don't go well together as in the example below:



AN EXAMPLE OF POOR CONTRAST

With this example, you can see the horror that has been wrought by using a light yellow with a light blue background. These two shades are both too close in coloration to be of use to us.

One trick to finding useful colors is to simply use complementary colors—colors that are opposite each other on the color wheel. Any number of tools exist to select color off of a wheel-type selector, and all you need to do is choose from colors on opposite sides to create a level of contrast that is legible and often aesthetically pleasing as well. See the example below where we've kept the same general shade of blue but alternated the text with something complementary:



AN EXAMPLE OF GOOD CONTRAST

Notice that the orange shade is much more legible on the blue background, creating a much more attractive layout choice in general for text that should be easy-to-read.

Now, when it comes to color, this isn't to say that you should always avoid using similar colors! When you're creating a design, you may well want to use colors that are shades of each other or that blend well together. This can create aesthetically pleasing designs with the various elements of your text. You should only avoid having colors that blend together easily when you're trying to say something important to your readers, when you're passing along textual information.

In addition to general legibility, color often impacts the way that we read a text—it colors our interpretation. For example, if you're trying to associate a document with a particular brand, you will want to use that brand's colors. Think about the way we can identify someone's affiliation at a given sports event based almost entirely on the colors they are wearing—the same holds true for texts. Certain brands have iconic colors and iconic imagery—by using those, we're drawing on the associations and immediately impacting how someone assesses the text.

There can be issues when we misuse color to draw associations—you want to make sure your usage is genuine and not misleading, else you risk the ire of your users. No one likes to be deceived by a document and using color to imply something that isn't accurate does just that.

In addition to brands, colors also have seasonal and cultural associations. We've already highlighted how black and orange can signal Halloween, and the same can be true for green and red for Christmas in the US. You likely can think of any number of color associations you have with seasonal and local events, and the number of associations that go with these colors reaches even further when we open up to an international audience. For example, Chinese weddings tend to make use of abundant amounts of red—white wouldn't be appropriate at all because of associations with funerals. At

the same time, a red wedding in current US culture might draw entirely different associations with a popular television and book series. Color and culture have a close connection that must be researched and respected!

Next, as with size, you want to use the contrast and impact of a color choice to correlate with the information's importance that you're sharing. If you're simply creating a background element that makes the text nicer looking, there is no duty to make things stand out—blending in is a good thing. But, if you're relaying important information, you need to make sure that it stands out! Don't use your contrasting colors for unimportant information while hiding the important stuff with colors that blend into the background. Make sure your text stands out!

Finally, keep in mind that colors can pose accessibility issues to those with different visible color spectrums. Keep in mind that combinations such as red and green can be difficult to many readers who cannot differentiate between these two colors! While going into a full discussion of colorblindness accessibility is outside the scope of this current text, you should make sure to test your documents and identify issues with color choices that may impact your readers. For example, green and black can be a difficult distinction for some with colorblindness to make: my father's favorite pair of pants is a set of olive slacks that are his favorite pair of black pants that he owns. A growing number of design tools have a built-in testing tool for color accessibility—if those are available for you, use them.

Just like other audience issues, color needs to be researched! You need to be aware of any brand connections with your color choices, any cultural significance related to your colors when you're creating a text, and any barriers that your colors may present to those with color blindness and different views of the colors around them. This type of work is simply due diligence for us as technical writers. Colors send a message, and we want to make sure we're using them to send a message we fully understand and intend to send.

LAYOUT AND PRINTING CONSIDERATIONS

One final layout consideration we need to tackle is the issue of printing, primarily an issue of bleeds and margins. If you've not done any professional printing, or at least any edge-to-edge color printing, you likely have no idea what I'm talking about. That's okay. We'll dive into the physicality of printing in this section and give you a brief boot camp on getting this stuff done.

Whenever you see a printed document that has color elements that go all the way to the edge of the page, you're seeing a choice that was designed around the physical nature of printing using bleeds. Edge-to-edge printing is not something that naturally happens in a production environment. You may have noticed with your own printers that you can't print all the way to the edge of a piece of paper—there is always a margin the printer simply can't touch. The same is mostly true for professional printing. To get around this, documents are printed on larger pieces of paper than the final product and then cut down to the actual size needed. Usually you pay per cut for this service, so if you had four sides of a text cut, you'd pay for the four different cuts in your run. (Note, this is for the full run, not per document).

The issue with cutting a text down to size is that cutting is not as precise as we'd prefer. There is almost always going to be some variability in the cut made by the printer. To get around this variabil-

ity, we make use of a document element known as a bleed. A bleed is a small extra margin around a text where all elements that go to the edge of the final text will bleed off the normal page to a secondary edge of the text, usually one that is perhaps a quarter of an inch or less more than the standard edge. This extra area is the bleed, and is used to make sure if the blade cuts too far outside the document there will still be designed elements to keep the text looking as intended. The same is true for the opposite side—you generally don't want important information within the same margin of the bleed on the inside of a text's border either—the cut can be too far in either direction.

When you set up your document for these types of printing, you'll want to go into your document settings and create a bleed. The size of the bleed will depend on where you're getting the document printed—different places with have different tolerances they prefer. Once you've set the bleed, you'll want to make the printer aware of the bleed that will need to be cut off the text to reach the ideal size.

In addition to the bleed, you'll want to be aware of the binding's impact on your text. Any text that is bound by some sort of spine will have less room on the inside of each page for legible content. Too close to the spine of the text and your words will be lost in the page—especially on documents with a hefty spine.

SECTION END PROMPTS

1. Think about colors and connections. What colors are associated with your campus, with events on your campus, and with groups there? What about with your workplaces or your hometowns?
2. Bleeds are a concept that can be foreign at first. Do some searching for designs that use edge-to-edge color or images or text and assess how they use the bleed. What do you think the document would look like after the margin, in the space for the bleed? What freedom does allowing elements to hang off the text provide for you as an author or designer?

TYPOGRAPHY

Having looked at layout, we need to next cover the subject of typography in document design. Typography is a massive subject, one that we could spend an entire semester on and still find ourselves lacking by some metrics. For our purposes, we will look at how typography impacts our work as technical writers and investigate the choices that we have at the level of typography to tweak the appearance of our texts and their impact. We'll discuss fonts and font families; the attributes of these fonts and how they impact our texts; choices of kerning, tracking, and leading; and font availability.

In general, I think we find ourselves in a world that is more aware of fonts and font choices than previous generations. We have entire documentaries available on the font Helvetica. We have folks that will instantly turn their noses at the usage of Papyrus or Comic Sans. Fonts and their names and impact are a bit more on our minds in popular culture, but these issues I've hit on only scratch the surface of what a font is and how we can view it.

For one, if we're going to be traditionalists, we should distinguish between a font and a typeface. Generally speaking, when we discuss fonts, we're really discussing typefaces. Typefaces are the full

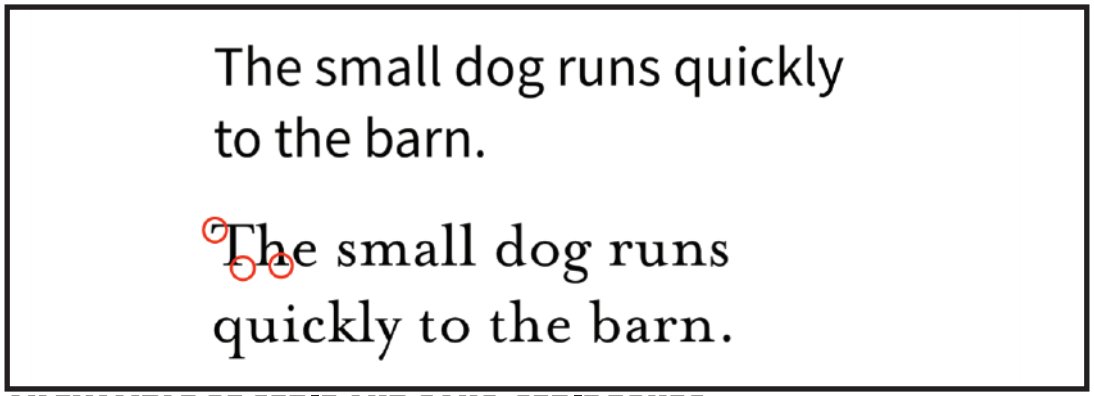
collections of the fonts of a particular family that share a common design. You may not realize it, but each particular variation of a font is often designed by a designer creating a typeface. There are separate variations for regular, italic, bold, and small caps, just to name a few. These variations are designed by the font's creator to maintain the font's aesthetic and legibility throughout. With that said, not all fonts have these options, or more correctly, not all typefaces have fonts with all of these variations. In those cases you may simply not have the option to bold or italicize or small caps your font—you're running into limits in what designer intended. Now, some programs will override this distinction and give you italics and bolding and small caps where none exists, but those options are usually less aesthetically pleasing and more likely to clash with the rest of the typeface.

Going beyond the distinction between typefaces and fonts, we could go into different traditions of fonts and font designs. Suffice it to say that we can see fonts in a couple of ways. Some fonts are historically designed and oriented—they are recreations of classic fonts that were used in a particular era by a particular printer or artist. In the case of book printing, the font may be based on a typeface that was used by a particular printer. In the case of comics or other visual texts, the font may be based on a particular lettering style. On the opposite end of the spectrum are novel fonts, fonts that are created by their designer within particular traditions but without a direct one-to-one historical target. We could go even further down this rabbit hole, but for our purposes this amount of awareness should work for us.

ATTRIBUTES OF FONTS

When we look at fonts, we often use the most basic of distinctions to decide the difference between two different competing typefaces. One may simply look better than the other to our eyes, but fonts have any number of fairly universally recognized attributes that we can discuss, as well as distinct personalities. Moving beyond simply liking a font to choosing a font based on its attributes and personality gives us even more ability as technical writers to shape the way our texts impact readers and the way that we research our projects.

First and foremost we can divide fonts by whether or not they have serifs, tiny little embellishments on the letters, often referred to as feet. Serif and sans-serif fonts as they are usually referred to, have different aesthetics that can be traced in any number of directions. Below you'll find an example of the two types of fonts, with serifs highlighted in red:



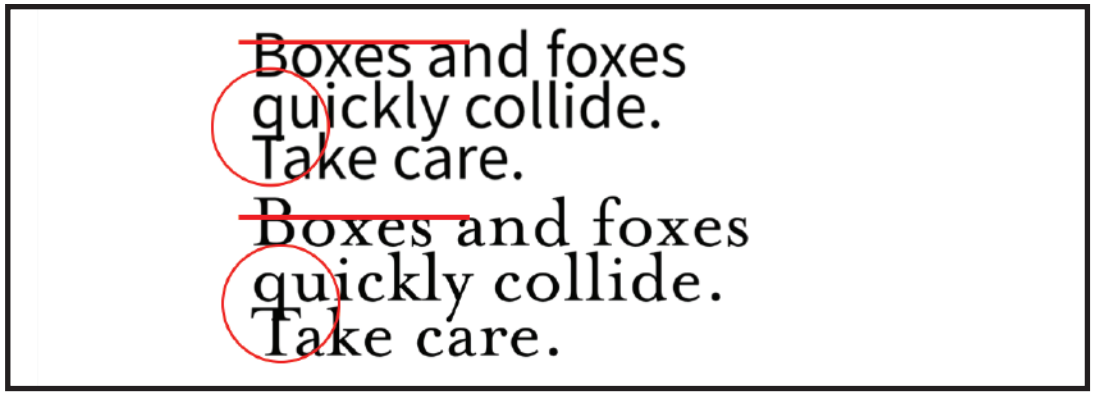
AN EXAMPLE OF SERIF AND SANS-SERIF FONTS

In the first sentence above, we see a sans-serif font. The letters terminate with solid blocky forms with no extra embellishment. In the second example, we see a serif font, one that has the small feet on the edges of the letters.

There are any number of claims made by various sources that about whether serif or sans-serif fonts are superior for different usages. The traditional line is that serif-fonts are best used for body text because the feet allow the text to flow together well. Sans-serif are used in this line of thinking as the headings and headers because they are stark and each letter stands out crisply. Some will also claim that electronic screens are best suited to sans-serif fonts, but there is conflicting research on this subject.

For our purposes, we want to be aware of these differences and use them rhetorically—to persuade and inform our readers. Because sans-serif and serif fonts have a clear visual difference, we want to use that difference to our advantage. We can use serif fonts for one type of information and sans-serif for another, correlating font type with the information type available. We can also think about the cultural character of each choice—serif fonts tend to feel more formal and bookish whereas sans-serif fonts tend to be more minimalist and high-tech in their feel in our current culture (that can change). We can take advantage of these differences and use the font family that best fits the aesthetic and audience we have chosen.

Going beyond serifs, we can also look at the x-height of a font and the behavior of ascenders and descenders in the typeface. As we mentioned previously, x-height refers to the relative height of the lower-case letter x compared to the upper-case letters of the font. The x-height of a font can be used to judge how well the font will perform at small sizes; in addition, a shorter x-height may look less imposing at a larger size if you're wanting a larger font without overwhelming the reader. Ascenders and descenders are, as perhaps the names suggest, the elements of a font that ascend and descend from the normal line of text. Letters like "q" and "p" and "t" can be tricky with fonts that have substantial amounts of descending and ascending characters. See the image below for examples of each of these elements:

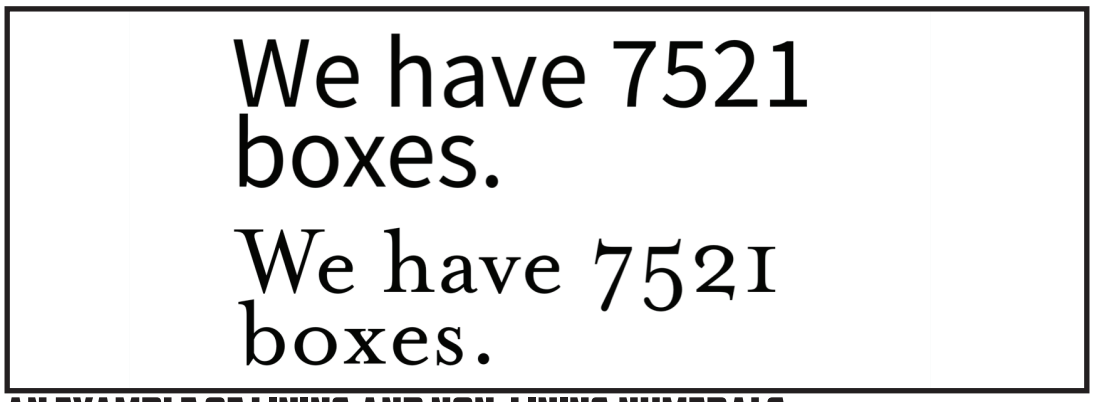


AN EXAMPLE OF ASCENDERS, DESCENDERS, AND X-HEIGHT

You can see in our two examples that the x-height of the first sentence is considerably higher than the x-height of the second. This creates a font that takes a good bit of room on the line and page. At smaller sizes this can be very useful, though it can feel cramped at larger sizes. With each font you see the ascending "t" and the descending "q." When the line spacing is tighter, as you see in the

example, these ascenders and descenders with more exaggerated lengths can cause issues of legibility that we need to be aware of. The more ornate and exaggerated these elements, the less a font can be condensed with tighter line spacing on the y-axis. (Hint: this is called the leading and we'll get to it soon).

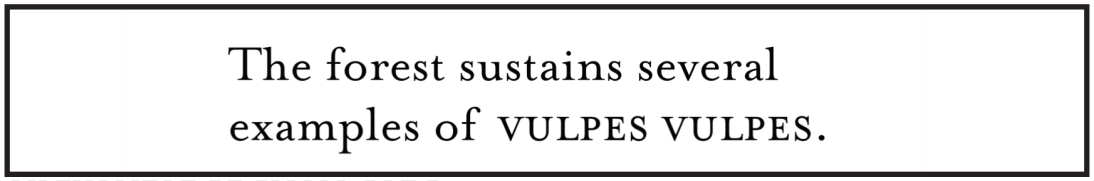
In addition to the letters, we need to focus on how numbers are presented in fonts. There are generally two types of font that are of importance to us as technical writers, those with lining and those with non-lining numerals. As perhaps the name implies, non-lining numerals are those that don't stay in an even line with each other. Lining numerals, on the other hand, line up nicely. The difference in readability is incredible and you'll almost always want to go with lining numerals for technical writing that conveys a lot of numerical data. Compare the two examples below:



AN EXAMPLE OF LINING AND NON-LINING NUMERALS

In this example, the first sentence makes use of lining numerals and the second uses non-lining numerals. You can immediately see the difference, with the second example using numbers that vary in their height and line placement. The first example is much more regular, creating a figure that can be referenced a bit easier. Lining numerals are to be generally preferred for passing along large quantities of data since they make reference easier. Non-lining numerals can be more effective for an aesthetic effect or to convey smaller amounts of numbers.

In addition to these attributes, some typefaces have what is referred to as a small caps font within the family. These small caps are a condensed version of the font in all caps that creates a more compressed yet readable variant of the font. You often see small caps in texts that will reference things like the scientific name of a particular species such as vulpes vulpes for a fox. With that said, not every font has an explicitly designed small caps—those that don't are restricted in their access to this format or have a fake version created by the word processor you're using. These fake version of small caps are often less legible and less distinct. See the example below for what small caps looks like when designed explicitly:

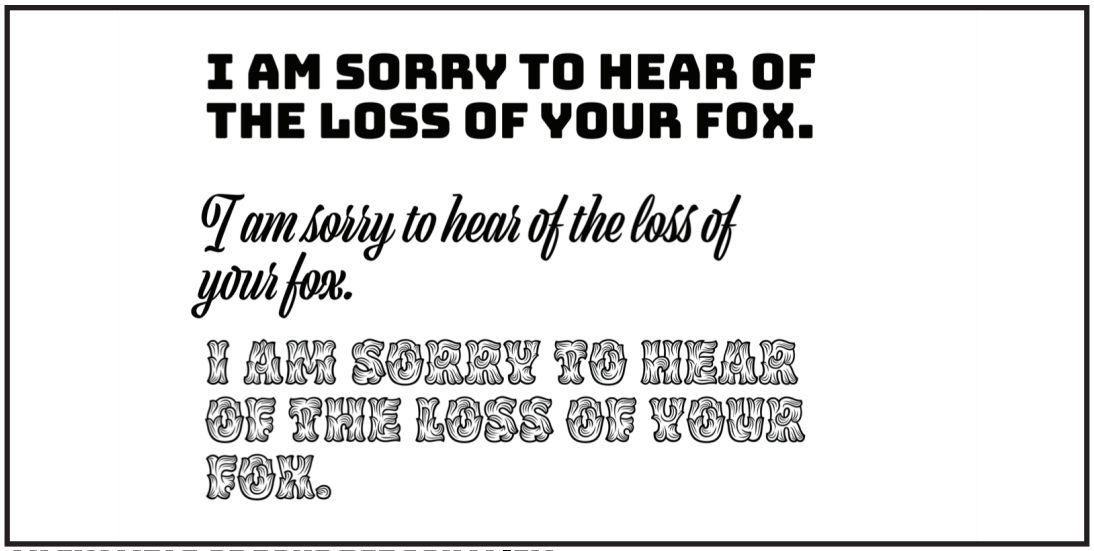


AN EXAMPLE OF SMALL CAPS

As illustrated above, small caps make sure of a smaller and slightly stylized version of the regular upper case font characters. These characters are sized close to the x-height of the font while maintaining the same general feel of the larger characters. You can see in this example that also lends itself to a slightly wider character as well.

Small caps can be useful for aesthetic reasons as well as practical and conventional uses. In the case of species names, you will often find the usage of small caps appropriate and superior to italics. Compared to italics, small caps stand out more and have more distinct characters. They are also more subtle than all caps, which in the present day are often associated with screaming or HIGH LEVELS OF EMOTION IN WRITING.

Having looked at the various attributes of fonts, we finally need to look at the collected impact of those attributes—the personality of a given font. In addition to having particular characteristics, fonts have an overall feel that makes them work in some situations and not work in other situations. Script-style fonts tend to feel more formal and antiquated or intimate whereas more bold and blocky letterforms seem convey an entirely different aesthetic. Decorative fonts, at the furtherest extreme, sacrifice paragraph-level readability for a particular look and feel. Compare the fonts below and the messages they convey:



AN EXAMPLE OF FONT PERSONALITY

In the example above, the message is one of general sympathy that you might find in a card that would be sent after the loss of a fox. Each of the fonts above conveys the message in a different way with varying levels of appropriateness. The first example is blocky and modern feeling, attributes we don't normally associate with sympathy. The middle example is a script-style font and conveys the aesthetic we'd associate with grief communications. The final example is a decorative font that simply feels out of place and difficult to read—this font may have its uses, but full sentences of text is likely not the ideal choice!

Before we move on, I want tack on one additional note about fonts and symbols, and specifically symbol-oriented font families. You may have wondered in the past, like many of us no doubt, about the purpose behind the Wingdings family of fonts. Why do they exist? Who can possibly read them? The answer is simple: they aren't designed to be read. Wingdings and other symbol-based fonts, such as stylized fonts of the Greek alphabet that you might use in creating content for a fraternity or sorority, exist to provide high-quality and scalable graphical indicators that don't have to be embedded as an image. Instead, they scale in the same way that a font would and provide access to certain images without the need for embedding other content. They may not always have immediate uses to us, but be aware they exist and that you can browse them using the symbol insertion feature of most design and word processing tools.

KERNING AND TRACKING AND LEADING, OH MY!

Having looked at the various attributes of fonts, we now want to turn our gaze to the ways that we can manipulate fonts for different effects. As with the attributes and personalities of a font, all of this work is done in service of the use we have in mind for a font and the way we plan to implement the font in our documents. Just like the attributes of a font, these manipulations of fonts can impact the way the fonts are received and the readability of the text that results from their usage.

Each of these attributes of fonts has to do with the relationship between individual characters and lines vertically and horizontally. By adjusting these characters, we can often fit a particular font into a particular use for a particular goal. Kerning and tracking and leading aren't necessarily something you'll be tweaking all the time—just like you won't need to constantly obsess about the x-height of a font. But, being aware of these options for font adjustment can be the difference between a deliverable that is good or okay and one that is excellent for a particular usage.

We'll start with kerning, the spacing between individual characters in a particular font. Kerning is something that is often hidden from us when we're working with fonts in a standard word processor. Unlike other options that we'll eventually look at, kerning works on a letter-by-letter basis, adjusting the spacing of different letters until we're entirely happy with the way they're spaced. One reason that kerning is often overlooked is because the choices regarding kerning are normally baked into any given typeface that you make use of. The designer of the font, in laying out the different glyphs, will have chosen what the natural kerning will be of the font.

The most likely scenario where you'd want to regularly adjust kerning would be when you're going to be using a font in a way that it wasn't designed to be used—often at a very large size. This isn't always the case—some fonts are designed for signage rather than paragraph blocks of print—but, more often than not you'll find yourself wanting to tweak kerning after you've made something excessively large. With programs that are more design-friendly, you'll be able to choose between optical and metric kerning. Metric kerning is the basic kerning baked into your font, whereas optical kerning applies math to the spacing to give you a better spacing at larger sizes. The idea behind the optical option is that the default kerning just won't work as well at larger font sizes where everything gets exaggerated—especially letter spacing.