Improving STEM Students' Writing Tutor Handbook

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Introduction

This project began when two English and one Geology faculty members at Marshall University formed an interdisciplinary relationship in hopes of improving STEM students' ability to clearly and efficiently communicate their knowledge of science concepts through their understanding of genre and discipline-specific writing conventions. Writing to learn and writing to communicate is crucial to the STEM classroom because writing "can help students understand, retain, and apply scientific concepts" (Soules et al., 2014). The research prefacing this handbook relies on the parallel conversations within Writing Center Theory, Genre Theory, and Science Writing. As is a crucial component of Writing Center Theory, writing aids a person's ability to learn and understand the content of a course at hand. For the STEM field, negotiating demands of science discourse is crucial, not just for clear communication, but for understanding proliferated content (Martin, 1993). Similarly, gaining access to literacies valued in the sciences is necessary to the assimilation of content (Unsworth, 1997).

As Genre Theory and Writing Center Theory explain, writing is not generalizable across disciplines; it is not separated from the disciplinary knowledge (Carter, 2007). Therefore, in many ways, Writing Center Theory complements the Science and Genre theorists mentioned above, as tutoring pedagogy requires a focus on global issues (e.g. negotiating the demands of scientific discourse) above local issues (e.g. correcting sentence-level concerns related to grammar and syntax). At the Marshall University Writing Center, staff are trained to view and explain writing as process, rather than product, which is useful for encouraging students to see their writing as revisable and as a skill that they can improve and build on. For STEM students, viewing writing as craft can help them assimilate to the demands of thinking and writing in their specific disciplines.

While all writing should strive for clarity and organization, in the disciplines, the purpose for writing, audience, questions asked by experts in the field, use of evidence, language and writing conventions, and citation styles are dependent on the subjects and genres in which the student is writing (Cullick & Zawacki, 2011). While it is not possible for a tutor to be an expert in each genre and discipline, the purpose of this handbook is to provide tutors with crucial background knowledge to adapt a Writing Center appointment to STEM students' needs. Furthermore, it is necessary that tutors are honest with students that they are not experts on all writing disciplines. This handbook provides additional resources that may be helpful during tutoring sessions, but we suggest that tutors take initiative to research information when they have questions about the purposes or requirements of a STEM writing assignment or concept.

Overall, the content of this handbook is designed to help students achieve STEM course outcomes while also appealing to students' lack of knowledge of STEM-specific and/or general writing conventions. During past in-class tutoring sessions, we (as Writing Center tutors) asked

students to complete a survey assessing the benefits and possible improvements of our assistance as we implemented the writing instruction suggested in this handbook into their classrooms. This handbook takes those results into consideration while utilizing the materials gathered from the work of the Hedrick Grant researchers, which will further inform current and future Writing Center tutors of the conventions of STEM writing. The goals of this guide are as follows:

1. Improve STEM students' understanding of writing conventions. In previous semesters, STEM-designated tutors focused on communication directly with STEM students by hosting in-class writing sessions; we hope for future efforts to demonstrate training directly to STEM instructors and teaching assistants. These training resources will inform them of how to develop more efficient assignment sheets, writing prompts, and rubrics, as well as address students' writing concerns and struggles in their own responses to writing assignments.

2. Help STEM students learn to prioritize global over local issues when writing and critiquing. When providing feedback on student writing, some instructors tend to focus on small surface level-errors (*local issues* related to spelling and grammar) over errors which affect the meaning of the writing (*global issues*, such as organization, clarity, and research). Because students may not be receiving the feedback they need in their classes, We encourage tutors to attempt to focus more on the content of writing rather than minor details.

3. Familiarize STEM students with the writing process. The components of the writing process include *brainstorming and prewriting* (this may be done by freewriting or making an outline), *research* (when necessary), *receiving feedback* (through peer review, conferences, or a Writing Center visit), *revision* (to focus on global issues), *editing* (to focus on local issues), and *submitting the assignment*. Once students realize that writing cannot be done productively in one draft attempt and must be broken down into steps, they may begin to reenvision their potential as writers.

4. Expand awareness of Writing Center services to students with diverse writing needs. We argue that as students practice and gain necessary help and instruction for STEM writing via their tutors and instructors, they will perform better in both introductory and upper-level STEM courses. Moreover, we advocate the Writing Center as a useful resource for any stage of writing ability and any discipline of study as a complementary service to STEM instructors' own writing-based curriculums.

While this handbook strives to consider the needs of lecture-based classrooms, sections of this handbook advocate that Writing Center tutors dedicate some time specifically to compiling their own knowledge of STEM writing conventions so they may accurately and effectively assist

students with STEM writing assignments. The information in this handbook is a compilation of our experience teaching and tutoring students of diverse disciplines writing conventions at Marshall University. We hope this handbook serves as an efficient tool, aiding Writing Center tutors' and STEM instructors' efforts of improving all STEM students' writing.

Evaluating Assignment Sheets & Rubrics

As a tutor, it is important to get a clear idea of what a client's instructor has assigned by taking a few minutes to look closely at the materials provided; this time can also be used to help clarify the student's own understanding of the instructor's expectations.

Quick Tips

- **Ask the student about the purpose of the assignment.** Before looking at any documents together, ask the student to explain the assignment as they understand it. This will help to reveal areas of misunderstanding later on as you look at the requirements together.

- **Pay attention to verbs.** When it comes time to look at the assignment sheet, finding and pointing out specific verbs can show students the purpose of their writing. Draw students' attention to words like *analyze, interpret, summarize, reflect*, and discuss what these kinds of actions should look like in relation to the writing assignment (for more information on verb usage refer to the "Identifying STEM Writing Conventions" section of this handbook on page 10).

- **Pay attention to lists/bullets.** Often, instructors will organize their assignment sheets into sections that include clear lists of expectations. Using these listed requirements, a tutor may be able to help students develop a natural format or structure to their assignment.

- **Ask students if any other resources have been provided by the instructor.** This could include rubrics, models of the assignment, or readings/guides about writing within the specific STEM discipline. These documents can help both the tutor and the client navigate expectations.

  - If a rubric is present along with the assignment sheet, the tutor can draw attention to the elements of the assignment that the instructor seems to be prioritizing. Pointing out all of the criteria on a rubric that aren't related to grammar/mechanics can help keep the student's focus on global issues first.

Examples

If a geology student came to the Writing Center and presented an assignment sheet like the one on the following page, here are some questions that might come to mind for the tutor and student to explore together:

- **Which pieces of the assignment involve formal writing?** -- In this case, the tutor might draw specific attention to the "written report" section of the assignment sheet. Many STEM writing assignments are the culmination of larger projects that involve labs, exercises, or data collection of some kind. The student should be able to explain what pieces of the assignment have already been worked on in class and how they apply to the writing assignment.

- **What kind of writing is the assignment sheet asking for?** -- A tutor could draw special attention to the verbs "describe," "summarize," and "interpret." How can instructions like these be used to inform the organization of the assignment? For instance, the tutor might ask which would most naturally come first -- summary or description?

- **What does it mean to "interpret the geologic history?"** -- is the structure of interpretation inherently chronological (based on time), or can the student simply hypothesize a group of events that occurred within the rock structure throughout its existence? Don't forget to use the student as a resource and involve them in the process by asking questions. If they are unsure, it could be something to look up or interpret from other materials provided by the instructor. Asking questions about STEM-specific writing/processes can give the student a sense of agency and keep them engaged in the appointment.

***Note:** When dealing with unfamiliar disciplines/STEM fields, try to think of this early conversation as exploratory--when looking at the provided materials, brainstorm specific questions like the ones above and do not hesitate to present them to the student. Showing them how you process an assignment and investigate meanings will help them learn to do so on their own.

Sample Assignment Sheet: Indoor Mapping Assignment*

There are four primary tasks to be completed and submitted as the final product. Use the rubrics

on the following pages to guide your final products.

1. Final Geologic Map [6 points]

When you have a map interpretation that is final, you will:
- Ink over every line drawn on the map using a black pen - this includes rock unit labels, orientation symbols, and contact lines.
- Color the different units of the map; the color used on the map must match the color used in the stratigraphic column for each rock unit.

2. Geologic Map Explanation [4 points]

Your geographic map explanation should:
- explain what symbols are used on the map (e.g. orientation symbols, contact line types, etc.)
- Include a simple stratigraphic column, with summarized descriptions for each rock unit (1-2 sentences each).

Remember:
- You will have lines that represent both where contacts between units are definite and approximated.
- Final explanation will be inked with black pen as well.

3. Written Report [6 points]

In your written report, you must:
- Include stratigraphic <u>description</u> of rock units
- <u>Describe</u> methods used to complete the map
- <u>Summarize</u> the overall structure observed in the map area
- <u>Interpret</u> the geologic history of the map area. (Be sure to include your observations in support of your interpretations in sections 3 and 4).

Other requirements:
- Minimum of 2 pages, maximum of 3 pages
- Typed/double-spaced - 12 point, Times New Roman font

4. Field Notes [4 points]

These do not need to be typed, but you should have some organized descriptions of what you see, the rock type, orientation measurements, etc. at each outcrop. Use the notes table provided.

Identifying STEM Writing Conventions

As a writing tutor of diverse disciplines, it is important to prepare oneself for tutoring sessions that may span outside the realm of traditional writing assignments and familiar genres, such as the argumentative essay composed in many humanities and social science disciplines. Tutors taking the initiative to familiarize themselves with various writing discourses, specifically within the STEM fields, can expand Writing Center services and resources to aid a diverse array of academic writers, enabling tutors to focus more clearly on the individual needs of each student utilizing Writing Center services.

In the instance that a STEM student arrives at a tutoring session with an unfamiliar genre of writing expressing concerns—like most students do regardless of their discipline—for local issues like grammar, syntax, and punctuation, elements that are pertinent to consider in all disciplines, the Writing Center tutor need not panic. Thanks to the resources found in this handbook, tutors will be able to determine the focus of the session using their newfound knowledge of STEM writing conventions partnered with what they already know about prioritizing global over local writing issues. However, without resources like this handbook offers, those local issues commonly found in all discipline of writing may end up being the predominant focus of a session, even though there could be more critical issues that both student and tutor are overlooking due to a lack of STEM writing knowledge. That is why it is critical that the tutor be prepared for these situations, as it is the tutor's responsibility to identify certain STEM writing conventions or lack thereof in student writing, without being instructed to do so by the student, because in some cases students may not be aware of their own discipline's writing conventions.

To aid tutors in their quest to diversify their knowledge by learning more about STEM writing conventions, the table below contains general elements to consider when analyzing STEM student writing, regardless of the specific field of study, content, or even writing genre. With this being said, tutors are not expected to know everything and they may or may not be experts in the discourse they are tutoring. Tutors are resources, and their main responsibility is to assist student writers as they acquire their own writing knowledge and practice their skills. As stated in the introduction of this handbook, if a tutor is unsure about something, feel free to ask the student questions about what they know about the genre in which they are writing, the discourse community, and their intended audience. And if more information or clarification is needed, do some research, ask another tutor for help, and/or refer back to the instructor-designed assignment sheet.

The following table provides "quick tips" on writing elements to look for when analyzing STEM student writing and provides examples and further resources for identifying, understanding, and explaining common STEM writing conventions.

Quick Tips	Examples

Adhere to Genre & Specific Assignment Formalities: For STEM writing assignments, students are often presented (via assignment sheets) strict formatting requirements or genre guidelines to adhere to. In those instances, the goals of the writing assignment should be made clear to students as far as the structure and other formatting requirements go (e.g. adhering to word or page limits, providing required information, organizing sections accordingly, etc.).	In the instance that clear instruction is not given, it is always useful to keep these tips in mind: ● Make sure your purpose and/or argument is obvious to the reader by incorporating a clear thesis statement. ● Keep paragraphs cohesive and focused on one idea, utilizing topic sentences to inform readers of said idea. ● Use transitional phrases on a sentence level and to connect paragraphs to enhance the flow of ideas locally and globally. ● Consider the organization of your composition globally so that the reader can most effectively understand the development of your ideas. ● Utilize a formal, academic tone. ● Avoid flowery and/or confusing language and complicated sentence structure. Below are helpful links that provide further explanation and examples for the tips above: **Thesis Statements:** https://owl.english.purdue.edu/owl/resource/545/01/ **Paragraphing:** https://owl.english.purdue.edu/owl/resource/606/01/ **Tone:** https://owl.english.purdue.edu/owl/resource/984/05/ **Formal vs. Informal Language:** https://owl.english.purdue.edu/owl/resource/608/02/ https://www.strose.edu/wp-content/uploads/2015/10/Writing-in-an-Academic-Tone-pdf.pdf **Complex or Confusing Language:** https://owl.english.purdue.edu/owl/resource/608/04/
Avoid Wordiness: Unlike some discourses of writing, STEM writing needs to be specific and to the point. To avoid wordiness, use the simple, direct words when possible rather than longer words or expressions. Also, make sure to avoid redundancy.	Be direct & simple: ● Commence vs. begin ● Prior to vs. before ● Subsequent vs. next ● Despite the fact vs. although ● In some cases vs. sometimes Avoid redundancy: ● They were both alike ● A total of 68 participants

	● Exactly the same ● Absolutely essential ● Has been previously found ● Small in size ● One and the same ● Period of time Source: http://www.research4life.org/training/authorship-skills-2/
Consider the Audience: When composing, make sure to consider the intended audience. If the audience is specialized and knowledgeable in the discipline, it may be appropriate to use jargon and other forms of discipline-specific terminology, but such language might not be as effective for a general audience or the general public, which many STEM professionals might find themselves writing for once they have received their degrees and have begun working/writing out in the community.	Terms that have different meanings for scientists and the public:

Terms that have different meanings for scientists and the public:

Scientific term	Public meaning	Better Choice
Enhance	Improve	Intensify, increase
Aerosol	Spray can	Tiny atmospheric particle
Positive trend	Good trend	Upward trend
Positive feedback	Good response, praise	Vicious cycle, self-reinforcing cycle
Theory	Hunch, speculation	Scientific understanding
Uncertainty	Ignorance	Range
Error	Mistake, wrong, incorrect	Difference from exact true number
Bias	Distortion, political motive	Offset from an observation
Sign	Indication, astrological sign	Plus or minus sign
Values	Ethics, monetary value	Numbers, quantity
Manipulation	Illicit tampering	Scientific data processing
Scheme	Devious plot	Systematic plan
Anomaly	Abnormal occurrence	Change from long-term average

Source: https://blogs.baylor.edu/stem-access/2012/07/scientific-jargon/

Understand & Use Strong Verbs: **Assignment sheets:** Regardless of the discipline, it is important for any student writer to adequately and thoroughly *analyze* assignment instructions before employing the steps of the writing process. Before drafting, students should	Below are two links that provide myriad examples of verbs and their usage/meanings in academia, regardless of discipline. Following those links is an image that depicts common verbs used in academic assignments sheets to provide instruction: Common Verbs & Expressions Used in Academic Writing: https://owl.english.purdue.edu/owl/resource/980/05/

evaluate assignment sheets, paying close attention to what the assignment is asking them *to do*, as they consider the specific **verbs** used to provide instruction. For example, the word "analyze" or "the action of providing analysis" can seem different depending on the discipline in which the student is being asked to perform such an action. For example, in STEM, students may be asked to *analyze* data, or *evaluate* their conclusions, while students in the humanities may be asked to *analyze* or *provide analysis* of a textual reference taken out of its original context, explaining their understanding of the referenced ideology and how that information builds their own argument.

Student writing:

In their own writing, students should be just as aware of the meanings surrounding certain verbs they choose to employ and how words/phrases can be interpreted differently depending on the audience or writing context (e.g. refer back to the chart above that provides examples of words that are understood differently by scientists and the general public). Furthermore and as STEM students find themselves engrossed in the writing process, it is important to spend some time revising and improving weak verbs or verb phrases, because quality writing consists of strong verbs that take up less space and carry more weight. In the English language, verbs can take the form of nouns (e.g. to analyze = analysis; to contradict = contradiction; to summarize = summary). However, most of the time, the use of the verb-turned-to-noun requires some form of introduction on behalf of the verb "to be," which contributes to lengthy, weak verb phrases. When revising, it is important to eliminate any lengthy verb phrase, utilizing specific, one-word verbs when possible.

Bloom's Taxonomy Action Verbs:
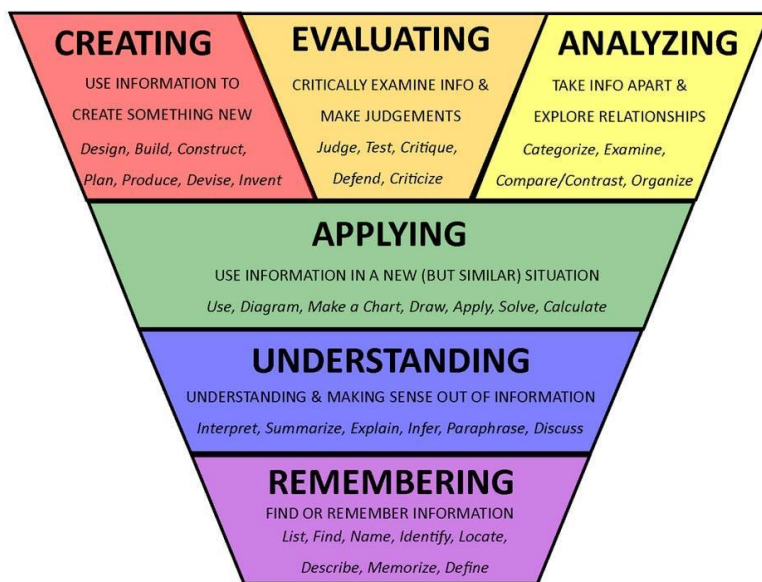http://www.fresnostate.edu/academics/oie/documents/assesments/Blooms%20Level.pdf

Image source: https://carleton.ca/viceprovost/assessment-of-learning/learning-outcomes/blooms-taxonomy/

The table below shows ways how "to be" verb phrases can be omitted and replaced with stronger, one-word verbs:

Verb	Longer Sentence	Concise Sentence
Agree	The results **are in agreement** with prior findings.	These results **agree** with prior findings.
Analyze	We **performed an analysis** of several factors.	We **analyzed** several factors.
Contradict	Our results **are in opposition** to Johnson's study.	Our results **contradict** Johnson's study.
Improve	Our method **is an improvement** over prior systems.	Our method **improves** on prior systems.
Localize	AjeA was **found to be present** in the nucleus.	AjeA **localized** to the nucleus.
Summarize	Table 1 presents a summary of the patient	Table 1 **summarizes** the

	data.	patient data.

Source: http://www.aje.com/en/arc/editing-tip-powerful-verbs/

The source link following these two tables contains information on 47 phrasal verbs that should be replaced with strong, one-word verbs. The source depicts two kinds of phrasal verbs—separable and inseparable. Below are some examples of the two forms:

Separable phrasal verbs	Example sentence	Replacement one-word verb
Add up	James **added up** the number of affirmative responses	Calculate
Buy out	The large company **bought out** the smaller.	Purchase (someone's assets)
Set up	The equipment's sensitivity meant we had to **set** it **up** with utmost care.	Arrange

Inseparable phrasal verbs	Example sentence	Replacement one-word verb
Get away	Several of them sought to **get away** from the cold winter night.	Escape
Fall apart	The board of directors **fell apart**.	Disintegrate
Take after	This new state **takes after** its regional neighbors	Resemble

Source: https://www.scribbr.com/academic-writing/47-phrasal-verbs-and-their-one-word-substitutions/

The following link provides more examples of phrasal verbs and how to omit them in your writing: https://owl.english.purdue.edu/owl/resource/630/01/

Be Precise with Adjectives & Details: When choosing adjectives or employing words to convey meaning, avoid using words that do not carry specific or adequate meaning or that could be considered informal	- Avoid words like: good, bad, slow, fast, unusual, interesting, etc. - Vague description: "Per capita income rose slightly."

according to academic and/or STEM writing standards. When possible, utilize specific measures and quantities to enhance reader understanding.	Specific details: "Per capita income rose 3% to $732."
	● Informal language: "The patient was very fat."
	Formal language: "The patient was obese."
	● Inadequate information: "Rural infrastructure development has the capacity to catalyze significant non-farm employment."
	Sufficient & specific detail: "Building roads, schools, hospitals, dams, and other public works can provide many jobs off the farm for rural people."
	Source: http://www.research4life.org/training/authorship-skills-2/
Identify Passive/Active Voice: In humanities disciplines, use of the active voice is advocated while passive voice is avoided. In some cases, STEM assignments may require students to compose strictly in passive voice, to avoid passive voice altogether, or suggest that it be used when necessary but with caution. As a tutor, it is important to be aware of these assignment requirements when analyzing STEM student writing, but more importantly, to be aware of a passive and active voice sentence structure. In the active voice, somebody does something; in the passive voice, something is done. Moreover, active voice utilizes fewer words and employs clearer meaning.	● Passive: "Tests were conducted to determine the rate of diffusion." ● Active: "The staff ran tests to find the rate of diffusion." ***Note:** the passive example is missing a subject (the staff who ran the tests). ● Passive: "The possible causes of the disease are now being looked into by the institute's specialists." ● Active: "The institute's specialists are studying possible causes of the disease." ***Note:** the passive example contains a subject, but the structure of the sentence is nontraditional in that the typical "subject-then-verb" structure has been altered and literally switched to "verb-then-subject." The verb (are now being looked into) prefaces the subject employing the action (specialists) in the passive example, while the active sentence utilizes the typical subject-then-verb structure—"the specialists" (subject) "are studying" (verb). Source: http://www.research4life.org/training/authorship-skills-2/
Use Caution with Adverbs: Avoid overusing modifiers that do not add meaning or that may alienate the reader.	● Overused modifiers: very, actually ● Ineffective adverbs: clearly, obviously

Employ Techniques of Quoting & Paraphrasing: The ability to employ effective and ethical techniques of paraphrasing and quoting is important for students learning and writing in all disciplines, as the genres of research writing and literature reviews span across programs. When paraphrasing or quoting it is important to correctly cite the borrowed information (reference the section focusing on APA formatting in this handbook for more information on proper formatting); this information will typically be a shorter version of the original and should be somewhat different in diction (word choice) and syntax (arrangement of words and phrases).
 	
Tips for constructing a paraphrase:
   1. Change the syntax—switch the order of the clauses.
   2. Take and reference notes—instead of pulling verbatim from the text, formulate the ideas in your own words in your notes (this could take the form of a bulleted list) which will help separate the ideas from the original text before they are referenced in your own work.
   3. Avoid thesaurus language— simply finding synonyms for important words does not validate an attempt at paraphrasing.
***Note: copying more than four words in a row from the text requires a direct quote.
	Sample Article Source:
	Cech, E. A. (2014). Education: Embed social awareness in science curricula. *Nature, 505*, 477-478. doi:10.1038/505477a
	
	Original Passage:
	This culture of disengagement is a concern because most STEM problems have cultural and political issues built into them. The early design of safety airbags in cars, for example, was subject to gender bias. In 1993, the US National Highway Traffic Safety Administration dictated to manufacturers that the rate of force for airbag deployment had to be strong enough to protect an unbelted, average adult male. Car designers did not test their airbags on dummies of the average weight and stature of women or children; injuries and deaths followed.
	
	Sample Paraphrase & Quote:
	Paraphrase is bolded; Quote is in quotation marks.
	
	Cech (2014) noted that safety airbags in cars were initially rated according to their performance protecting adult males. She went on to say, "Car designers did not test their airbags on dummies of the average weight and stature of women or children; injuries and deaths followed (Cech, 2014)."
	
	***Note: Although the quote is correctly distinguished due to the use of quotation marks around the borrowed information, notice that the quoted information is blended with the new writer's own words in the sentence and does not stand alone as its own sentence in the new writing context.

Providing Feedback

Most STEM feedback from instructors is focused on content, rather than writing, but if students do not receive feedback on writing, they will not gain the skills they require to make productive revisions. Furthermore, most writing feedback is given without explanation, resulting in confusion for students who need to revise, but are not sure how or what they are revising. Because of this trend, it is crucial that tutors understand how to respond to STEM writing and provide suggestions that students can learn from. According to Thaiss and McLeod, "when teachers in any setting are untrained to read and respond to versions of English that they do not regard as 'standard,' they are likely to underestimate the quality of thinking expressed in the writing and perhaps to pay too much attention in their responses to what they perceive to be linguistic error" (2014). An example of identifying this "linguistic error" is to focus too much on local issues, like comma usage. Giving students thoughtful and specific feedback can be done by asking questions about the writing, rather than only pointing out mistakes, and by asking students to use critical thinking skills to identify patterns of error they tend to make in many of their writing assignments. This allows them to implement the understanding of writing conventions into STEM work. The goal of tutor feedback is to provide foundational knowledge about writing so students will learn to identify these issues independently as they continue their studies.

Quick Tips

- **Familiarize yourself with the assignment sheet, rubric, and any instructor comments,** and make sure that the student understands the language used. For example, if the instructor comments that the student needs a "clearer thesis," make sure that they know what a thesis statement is and what the expectations for a thesis are, according to the assignment sheet (Bardine, 2000). Be aware that students may not understand what is asked of them by their professors. According to Thaiss and McLeod, "that academics are so grounded in their own disciplinary discourse conventions is an advantage to the student, but it is also an immediate challenge, precisely because those conventions seem so natural to those fluent in them that it is difficult for them to see why students struggle as they learn" (2014). Because communication between instructors and students may not always be clear, the tutor may serve as an interpreter for the student. For more information on interpreting assignment sheets, refer to our guide on page 6.

- **Ask questions about the assignment.** It is important to understand exactly why a student is visiting the Writing Center. Rather than jumping into reading their paper and making notes, try to identify what they know about trends in their writing errors. Very often, students come to the Writing Center to request proofreading and help with grammar, but you must establish that tutors do not provide editing services. Rather, ask the student

what their professor tends to deduct points for on previous assignments if they do not have a draft with comments.

- **Ask the student to read their paper aloud.** When students read their writing out loud, they may catch flaws in logic and language that you may not immediately identify as someone who does not specialize in STEM fields. Reading aloud can also draw attention to local issues that can be quickly addressed by the student themself.

- **Be as specific as possible.** Try to be detailed in letting students know where they need to improve, such as supporting a claim with evidence, organizing their writing, or properly formatting a paper, and do not overwhelm them with many minor comments. A productive rule of thumb is to provide students with no more than three areas of improvement they may address after each Writing Center appointment. Once students are aware of problem areas, they may begin to make recurring Writing Center appointments to help meet their needs and acquire lasting writing skills.

- **Prioritize global over local issues of writing.** Contemporary writing pedagogy advocates for tutors to prioritize global over local issues when responding to student papers. This means that tutors should spend less time focusing on small, surface level problems, such as grammar and spelling (local issues), and inform students of major improvements that could be made in their writing, such as organization, logic, clarity, use of external sources, and other problems that affect meaning. Because global issues should have the most effect on students' grades, responding to grammatical issues is often not a productive use of time in your tutoring session.

Examples

The purpose of Writing in the Disciplines is to "[help] students become critical thinkers and problem solvers, as well as [develop] their communication skills" (Thaiss & McLeod, 2014). Because instructors may not always address communication skills in class, tutors may be a student's primary resource of this training.

While providing feedback to STEM students' writing, consider the following in each session:

- Audience
- Purpose
- Modes of Thinking
- Genre

In order to address the goals of the assignment, ask students to write down questions about the assignment or their paper so you are able to keep their needs in mind during the entire session. This also establishes the rule that tutors will not focus on grammatical error in detail (Thaiss & McLeod, 2014).

In addition, practice "feed forward," not "feedback." This means that tutors should focus on what students could do differently, rather than what they have not done well. Ask open-ended questions and offer suggestions that connect multiple elements and patterns of their writing, such as organizational methods ("Commenting Strategies"). This also ensures that you do not provide overwhelming feedback on too many topics.

Additional Resources

- ["Commenting Strategies"](#)
- [WAC Clearinghouse](#)

Navigating the Drafting/Revision Process

The requirement of multiple drafts is often dependent on the instructor's preferences, but the drafting process is useful for any writing assignment regardless of expectations. If instructors do not require one or more drafts to be turned in, tutors should advise students to complete their assignments on a strict timeline in which they challenge themselves to make progress on a draft. A timeline could be paced by scheduling multiple Writing Center appointments before the due date. This encourages productivity and prevents students from completing writing assignments at the last minute. While all writing tutors likely know that peer review is an effective practice of drafting, it is rarely utilized in the STEM fields. If a student comes to the Writing Center with an early draft and adequate time before the due date, tutors can encourage them to return before submitting the final draft and treat each session like an opportunity to peer review. The following guide provides three methods for tutors to begin advocating the drafting process when students seek help in the early stages of writing.

Quick Tips

- **Make Lists:** After reviewing the assignment sheet, rubric, and any other material provided (refer to the "Looking at Assignment Sheets & Rubrics" guide on page 6), you should ask the student if anything about the assignment is unclear. As someone who is not an expert in the STEM disciplines, it is crucial that students address all questions they have about their coursework so you can research them together.

  Here are some possible points of discussion to note with the student:

    - Previous conversations with their professor about the assignment
    - Key terms they need to use in the writing
    - The weakest or strongest parts of their drafts, if they have them
    - What they want to address during the session
    - Questions they would like to answer by the end of the session

  (source: http://wp.rutgers.edu/attachments/article/425/The%20Task-%20A%20Guide%20for%20Tutors.pdf)

  You may also develop a self-review checklist based on the rubric, which allows students to critique their own work during the tutoring session and on their own time. Possible criteria to include are formatting requirements, expectations for content, length, citation requirements, or stylistic guidelines.
- **Freewrite:** Pedagogist Peter Elbow compares freewriting to talking out loud, with the primary difference being that those thoughts translate directly onto the page. Elbow

argues that writing consciously, or traditionally, causes writers to "edit unacceptable thoughts and feelings" ("Freewriting"). Tutors can encourage freewriting in order to relieve pressure from the session because students are not judged for poor writing; it is primarily used to help them reach an idea or a discovery. Freewriting is a useful exercise during tutoring sessions when the student comes to the Writing Center without a draft.

Freewriting prompts may uncover students' purest analyses and opinions. In order to make a prompt for a student, you may try to summarize their assignment sheet into one or two questions that they may respond to while you time them. The exercise may range from five to fifteen minutes. You may also encourage students to practice free writing on their own time and return to the Writing Center with what they have produced.

- **Outline:** Because it is likely that the student may have received little instruction on organization, tutors can help them establish the basic outline of their paper in the initial tutoring session. As stated in the "Looking at Assignment Sheets & Rubrics" guide, instructors may organize assignment sheets into lists, which might help the student establish a format or structure to their paper. Be sure to discuss why certain paragraphs might follow one another and what transitional statements might be used to clarify the purpose of this organizational pattern.

APA Style Basics

When it comes to format, it is important to encourage a student to adhere to any specific requirements an instructor gives for an assignment. For prescribed styles like APA, there are guidelines you can follow and share with students to help demystify the discipline's expectations.

Quick Tips

- **Writing style** -- APA style requires writers to write a certain way. It is helpful to show students this aspect of APA, as most consider APA style simply a set of guidelines for formatting. A few hallmarks of APA style writing include:

    - Reducing Bias in language/increasing objectivity
    - Specificity
    - Active voice

- **Structure** -- In the event that a student is being asked to write a formal APA-style research paper, explaining the functions of each section can greatly help guide the student's writing. the following sections/elements are present in APA research papers:

    - Title page
    - Abstract
    - Introduction
    - Method
    - Results
    - Discussion
    - References
    - Appendices

- **Format** -- While format is not a global issue, students may need some guidance figuring out how their APA paper should look.

    - Font - The APA style guide suggests using a 12-point serif typeface (like Times New Roman) for the main text of your paper, and a sans serif font (like Arial) for figure labels.
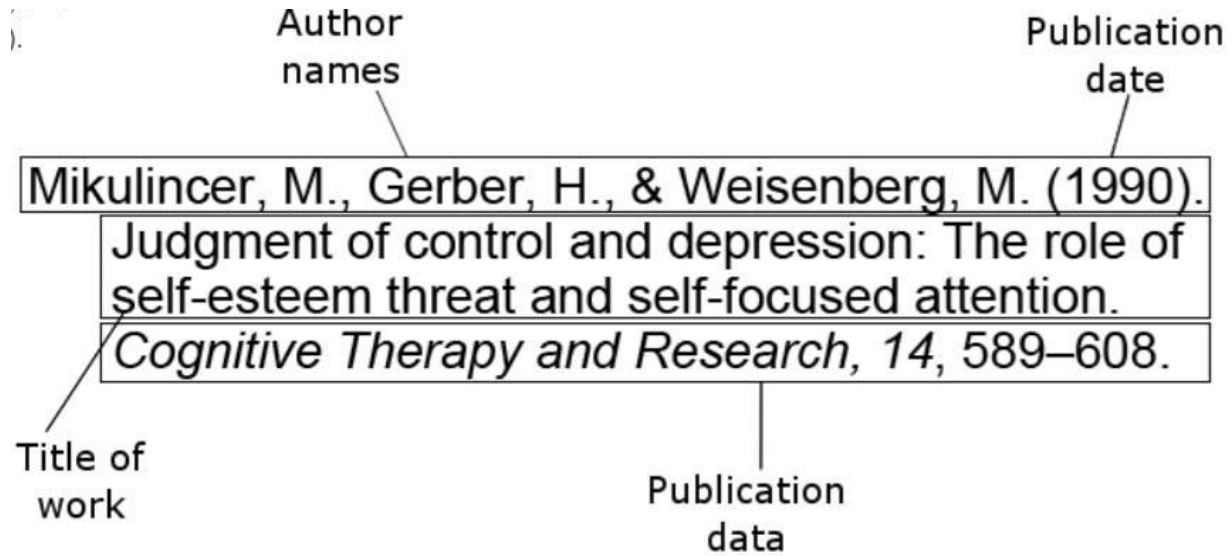
○ The entire paper should be double-spaced, flush-left, with indents of ½ inch on the first line of each paragraph. All margins should be set to 1 inch.

○ Header - The title page of the paper should introduce a "Running Head" that appears on the top left of every subsequent page.

○ Headings - APA has very specific guidelines for headings. Refer to the table below:

APA Headings	
Level	Format
1	**Centered, Boldface, Uppercase and Lowercase Headings**
2	**Left-aligned, Boldface, Uppercase and Lowercase Heading**
3	**Indented, boldface, lowercase heading with a period.** Begin body text after the period.
4	***Indented, boldface, italicized, lowercase heading with a period.*** Begin body text after the period.
5	*Indented, italicized, lowercase heading with a period.* Begin body text after the period.

("APA Headings and Seriation", 2013).

● References -- The following diagrams from the American Psychological Association's APA Style guide provide examples of APA references and in-text citations.

Example Reference

Author names → Mikulincer, M., Gerber, H., & Weisenberg, M. (1990). ← Publication date

Judgment of control and depression: The role of self-esteem threat and self-focused attention.

Title of work → *Cognitive Therapy and Research, 14*, 589–608. ← Publication data

(American Psychological Association)

Example Citations

Table 6.1 Basic Citation Styles

Type of citation	First citation in text	Subsequent citations in text	Parenthetical format, first citation in text	Parenthetical format, subsequent citations in text
One work by one author	Walker (2007)	Walker (2007)	(Walker, 2007)	(Walker, 2007)
One work by two authors	Walker and Allen (2004)	Walker and Allen (2004)	(Walker & Allen, 2004)	(Walker & Allen, 2004)
One work by three authors	Bradley, Ramirez, and Soo (1999)	Bradley et al. (1999)	(Bradley, Ramirez, & Soo, 1999)	(Bradley et al., 1999)
One work by four authors	Bradley, Ramirez, Soo, and Walsh (2006)	Bradley et al. (2006)	(Bradley, Ramirez, Soo, & Walsh, 2006)	(Bradley et al., 2006)
One work by five authors	Walker, Allen, Bradley, Ramirez, and Soo (2008)	Walker et al. (2008)	(Walker, Allen, Bradley, Ramirez, & Soo, 2008)	(Walker et al., 2008)
One work by six or more authors	Wasserstein et al. (2005)	Wasserstein et al. (2005)	(Wasserstein et al., 2005)	(Wasserstein et al., 2005)
Groups (readily identified through abbreviation) as authors	National Institute of Mental Health (NIMH, 2003)	NIMH (2003)	(National Institute of Mental Health [NIMH], 2003)	(NIMH, 2003)
Groups (no abbreviation) as authors	University of Pittsburgh (2005)	University of Pittsburgh (2005)	(University of Pittsburgh, 2005)	(University of Pittsburgh, 2005)

(American Psychological Association)

Giving a "Tutor Talk"

At some point in your time tutoring with the Writing Center, it may be necessary for you to visit a STEM classroom for a "Tutor Talk." These talks are particularly important for STEM classrooms because students often mistakenly believe that they cannot bring their non-humanities writing assignments to the Writing Center for help. The purpose of a "Tutor Talk" is to show students how the writing center can be a resource to them.

Quick Tips

- **Introduce yourself**. be prepared to introduce yourself to the classroom, as the instructor may or may not give a preamble for your presentation.

- **Explain the reason for your visit.** Tell the class that you are a representative of the writing center and that you've visited them to tell them about how they can use the writing center as a resource. Be sure to highlight that tutors in the writing center can help with their writing assignments in any class, including those related to STEM fields.

- **Engage students in conversation.** A good way to engage students in a tutor talk might be to ask (show of hands) if anyone has been to the writing center before and then ask what classes they visited for. Many will likely cite a humanities or liberal arts class as the reason they went to the writing center, which can open up a conversation about visiting for STEM classes.

  o Note: It is important to consider the instructor any time that you visit a classroom. Communication beforehand is good for determining and setting the expectations of the tutor talk. If an instructor is affording you a larger stretch of time and wants you to give writing instruction in addition to promoting the writing center, this is something that you can prepare and coordinate ahead of time.

- **Promote and Explain the Writing Center's services.** Let students know that they can come to the writing center for help in any stage of the writing process (including help interpreting assignment sheets).

  o If the classroom has the proper technology, pull up the writing center website and show students how to schedule. Be sure to show them the difference between face-to-face, e-tutoring, and online options.

  o Show students how to use the website's filters to find students who specialize in STEM writing.

- o Don't forget to allow time for students to ask clarifying questions about writing center services.

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