

(<http://csmatters.org>) 1 - 8

0b1 - 0b1000

Optional

The Basics of Research and Technical Writing

Unit 1. Your Virtual World

Revision Date: Jul 23, 2019

Duration: 2 50-minute sessions



Lesson Summary

Pre-lesson preparation

Review the Teaching Technical Writing slides to help prepare teaching the topics of research and writing. It may be wise to review citation styles and pick one you want your students to use -- as long as they are consistent, the particular style should not matter. For Session 2, you can print out the Cut it Out activities from the slides for your students if you want them to try for themselves on paper.

Summary

Students will learn the basics of technical writing and research, practicing skills including finding good sources, citing properly, and differentiating between quoting, summarizing, and plagiarism.

Outcomes

- Students will practice the style and process of technical writing.
- Students will learn and employ practical writing advice.
- Students will identify good and bad sources of information.
- Students will learn the importance of citing sources.
- Students will recognize there are different styles of citations.
- Students will quote and summarize from information sources.
- Students will understand the definition and consequences of plagiarism.
- Students will differentiate between plagiarism and proper attribution.

Overview

Session 1

1. Getting Started (5 min)
 - What is research?

2. Activity (15 min)
 - Finding good sources
3. Activity (25 min)
 - Plagiarism vs. Quotation vs. Paraphrasing
4. Wrap-up (5 min)

Session 2

1. Getting Started (5 min)
 - Who writes?
2. Guided Activity (40 min)
 - Cutting out useless words
 - Practice assessing written responses
3. Wrap-up (5 min)

Learning Objectives

CSP Objective

- *EU IOC-1 - While computing innovations are typically designed to achieve a specific purpose, they may have unintended consequences.*
 - LO IOC-1.F - Explain how the use of computing can raise legal and ethical concerns.

Common Core ELA:

- RST 12.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- RST 12.2 - Determine central ideas and conclusions in the text
- RST 12.5 - Analyze how the text structures information or ideas into categories or hierarchies
- RST 12.6 - Analyze the author's purpose in providing an explanation, describing a procedure
- RST 12.7 - Integrate and evaluate multiple sources of information presented in diverse formats and media
- RST 12.8 - Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text
- RST 12.9 - Synthesize information from a range of sources
- RST 12.10 - Read and comprehend science/technical texts
- WHST 12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes
- WHST 12.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
- WHST 12.5 - Develop and strengthen writing as needed by planning, revising, editing, rewriting
- WHST 12.7 - Conduct short as well as more sustained research projects to answer a question

- WHST 12.8 - Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source
- WHST 12.9 - Draw evidence from informational texts to support analysis, reflection, and research

NGSS Practices:

- 1. Asking questions (for science) and defining problems (for engineering)
- 7. Engaging in argument from evidence
- 8. Obtaining, evaluation, and communicating information

Key Concepts

- Research involves finding good sources of information and synthesizing knowledge to convey your understanding to others.
- Attribution of ideas, information, and quotes is an important facet of research.
- Plagiarism is a complex unethical practice that is not limited to simply copying language, and softer forms of plagiarism should be understood and avoided.
- Differentiating the quality of one source from another can be challenging, and often relies on contextual information (such as author, location, date of publication).

Essential Questions

- How does computing enhance human communication, interaction, and cognition?

Teacher Resources

Student computer usage for this lesson is: **required**

Additional resources on the basics of research include the following. Keep in mind that what will benefit students the most for this lesson is to focus on tips and guidelines related to content rather than generic advice like avoiding too many adverbs.

- EasyBib's Research Quick Guide:
 - <http://www.easybib.com/guides/students/research-guide/research-quick-guide/>
(<http://www.easybib.com/guides/students/research-guide/research-quick-guide/>)
- EasyBib's Plagiarism Flowchart:
 - <http://www.easybib.com/guides/students/research-guide/what-is-plagiarism/>
(<http://www.easybib.com/guides/students/research-guide/what-is-plagiarism/>)
- College Board has a separate AP course devoted to research (and related, general skills). They provide an outline of that course in the AP Research Course Framework (includes Learning Objectives and Essential Knowledge related to research skills):
 - <https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-research-course-and-exam-description.pdf> (<https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-research-course-and-exam-description.pdf>)
- Sharpen your academic skills (video on "Getting Started on Research")

- <http://stemtransfer.org/resources/posttransfer/academic-skills/>
(<http://stemtransfer.org/resources/posttransfer/academic-skills/>)

Lesson Plan

Session 1

Getting Started (5 min)

Discussion: What is research?

Refer to the "Teaching Technical Writing" slides in the Resources folder for an overview on technical writing and the process of research as well as advice on teaching those topics.

- To broach the topic of research and provide some basic definitions, start off with a guided discussion and pose the following questions to your students:
 - What kinds of research have you done before? What exactly did you do? Did you follow a process? What was the hardest part?
 - What is research? What are the steps of research?
 - Writing a research report is sometimes referred to as technical writing. How does technical writing differ from other kinds of writing, like the kind you might do in an English class?
- Remind students about the upcoming performance task and the expectations.
- The first step of research is picking a topic and finding sources, which segues into the next activity. For the purposes of practice, today's research topic is already chosen.
- A key insight to grasp is the difference between researching for yourself alone and researching to later convey your understanding through writing. When searching for information on your own, you may be satisfied with simpler, summarizing sources such as Wikipedia. However, when you intend to communicate and transmit research to others, you become responsible for its quality. For that reason both the quality of your original sources and attributing them (that is, not plagiarizing) become of paramount importance.

Activity (15 min)

Discussion about good sources of information and what meets that criteria [5 min]

- As a class, have your students try to list as many sources of information they can think of (up to a reasonable amount). Then ask which of these would be considered "good" sources of information, and why? What criteria make one source better than another? Can they think of a "bad" source of information? What makes it that way?

Finding good sources of information [10 min]

- Each student receives a copy (paper or electronic) of the "Website Evaluation Guide"
- Several things to note and keep in mind while using the EasyBib guide:
 - The criteria for evaluating websites are at **the end** of the guide. Some of the guidelines are vague; you may want to discuss a few precise examples with students.

- When doing research, the most crucial criteria for evaluating any source are the author's purpose and goal behind writing their article. Why did they write what they wrote? Students should always question an author's motivations while assessing sources (not just as a challenge, but to really understand the author and greater context). Is there some monetary reason for their authorship (which is not necessarily bad) such as they are journalists and it is their job, or they are running a website to support advertisements? Does the author have an immediate or indirect connection to the topic they are covering, such as are they an expert on the topic or an outside observer? Does the author have any potential political or other partisan reason for writing their source?
- The lack of a named author or editor is not automatically a mark against a source, depending on the context. Some sources publish good information without a specific author, such as Associated Press articles that lack bylines.
- In terms of authorship, the EasyBib guide uses examples such as "the author is a journalist" as a positive source in contrast with someone with "journalistic experience" as a negative source. These distinctions are sometimes unclear. While verifiable credentials may help assess trustworthiness of an author, some credentials may be fabricated or otherwise made to appear legitimate. Even verifiable journalists and other authors may be untrustworthy on certain topics or under certain circumstances. Again, the greater context matters. Students should be aware of this possibility and always ask themselves what an author's motivations for writing the given article may be.
- A website or other source adopting legitimate-sounding names or titles (such as "Encyclopedia") should not factor into positive criteria. Some sources will mislead for advertising or other purposes by taking lengths to appear credible.
- In terms of "currency" and up-to-dateness, both the context and purpose matter. A news source with an article that is no longer current but was covering news at the time is not necessarily a bad source. Similarly, informative articles that are several years old can still be valid depending on their purposed and topics they cover.
- Have students review the "Finding sources for your research" handout.
- A difference that students should keep in mind is the one between content distribution sources and content producers. In the case of a service like YouTube, the site itself is not a source (unless it is an official video from the company) -- the user who originally produces the videos is the source. So the fact that a video on YouTube does not inherently make it good or bad; it depends on the legitimacy of the video maker.

Activity (25 min)

Discussion about quoting, paraphrasing with attribution, and plagiarism [15 min]

- Use the "Writing Tips: Plagiarism vs. Citation" slides in the Resources folder to aid the discussion and give examples of plagiarism
- All academic writing requires appropriate attribution. The purpose of citation is multifaceted: it credits the original thinker, it establishes a chain of evolving ideas, and it demonstrates the writer has done a suitable job researching sources. Citing sources properly lends credibility to the researcher and is a necessary persuasive tool.
- Show or discuss an example citation (ideas: a quote, an in-text parenthetical citation, a citation from a paper's bibliography)

- Rule of thumb: if you are not the original source of an idea or fact that is not common knowledge, you should cite it!
- Any sentence you write that relies on an idea that is not your own should be cited. If the whole paragraph is about an idea from the same source, you can place the citation at the end of the paragraph.
- Discuss the definitions and difference among quoting, paraphrasing, and plagiarizing a source.
 - Plagiarism is taking credit for someone else's ideas as if they were your own.
 - Plagiarism is dishonest and unethical, and it ultimately undermines the credibility of the plagiarist.
 - The consequences of plagiarism are quite severe: you can be expelled from college, be fired from your job, and even have your degree revoked if you plagiarize.
 - Quotation is taking words verbatim from a source, surrounding those words with quotation marks, and specifically naming who said the quote and when/where.
 - In general, quotes should be no longer than a sentence or two at most.
 - Ideally, quotations should only be used as secondary evidence or to illustrate a point already made in your writing.
 - Quotation is not plagiarism as long as it is properly attributed.
 - Improper quotation (lifting text verbatim without using double quotes and/or stating the original source) is plagiarism.
 - Paraphrasing is taking words or ideas from someone and rewriting or condensing them in your own writing.
 - Try to be as clear as possible when you are paraphrasing to convey the source and what it is you are paraphrasing
 - Paraphrasing can be plagiarism:
 - Near-verbatim paraphrasing (just changing or omitting a few words or swapping in synonyms) is plagiarism
 - Summarizing without citing the source is plagiarism
- Finish with the examples in the slides

Practice judging plagiarism vs. appropriate citations [10 min]

- Give your students the handouts for "Examples of Paraphrasing" and "Plagiarism vs. Paraphrasing Exercise" (in the Resources folder) and have them complete it in pairs, groups, or as a class. Go over the correct answers and have them discuss why they labelled each.

Wrap-up (5 min)

Journal Entry

With the time remaining, have students reflect and write in their journal what topics they are considering for their performance task and which sources of information they plan to find first.

Session 2

Getting Started (5 min)

Discussion: Who writes?

Use the "Writing Tips Process and Style" slides in the Resources folder to guide this lesson and begin with the questions and overview on slides 2 and 3.

Guided Activity (40 min)

Interactive Lesson: The Writing Process [20 min]

- Have your students take notes. Warn them that this will be used in their homework!
- Continuing with the slides, go over the Writing Process and Style sections
- For the "Cut it Out" exercises in the slides, you may want to have your students follow along on print-outs of the slides.
- Continue through the rest of the slides

Group Activity [20 min]

- Pass the "Assessing Sample Performance Task Responses" handouts to your students.
- In pairs or groups, have your students complete the first handout, and before moving onto the next one, discuss with a group your decisions on how to assess the writing (the Assessments folder should have an example key)
- Complete the remaining handouts in the same fashion

Wrap-up (5 min)

Journal Entry or Homework: two options

Have your students reflect and write responses to one or both of the following:

- Write in your journal how you think technology and computers have changed research and writing over the past hundred years.
- Make a bulleted list of 10 writing tips you were taught about today (which you can reuse when writing your performance tasks in the future).

Evidence of Learning

Formative Assessment

Session 1 Journal:

- Have your students reflect and write in their journal what topics they are considering for their performance task and which sources of information they plan to find first.

Session 2 Journal / Homework:

- Have your students reflect and write responses to one or both of the following:
 - Write in your journal how you think technology and computers have changed research and writing over the past hundred years.

- Make a bulleted list of 10 writing tips you were taught about today (which you can reuse when writing your performance tasks in the future).



(<http://www.umbc.edu/>)



(<http://www.umd.edu/>)



(<http://www.nsf.gov/>)

Authored by: CS Matters in Maryland

Website: csmatters.org (<http://csmatters.org>)

Email: csmattersinmaryland@gmail.com (<mailto:csmattersinmaryland@gmail.com>)

This work is licensed under a
Creative Commons Attribution-ShareAlike 3.0 United States License
(<http://creativecommons.org/licenses/by-sa/3.0/us/>)

by University of Maryland, Baltimore County (<http://umbc.edu>) and University of Maryland, College Park
(<http://umd.edu>).