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# Documentation and Research Paper Setup

## Introduction

After organizing the raw data from your experiment and performing statistical analysis, you are ready to move to the next part of your research project—sharing the results of your experiment. You do this by writing a STEM research paper and/or preparing a poster and presentation. In a paper or a poster, you must properly document, or cite, the resources you used. In other words, you must document within your paper and in a list at the end of the paper the resources (e.g., journals, online material, books) you used to do the research project and paper.

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### Learning Objectives

By the end of the chapter, you should be able to

1. explain what documentation is and why it is important,

2. list the documentation guidelines that apply to all documentation styles, and

3. describe the connection between in-text citations and the Works Cited list.

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## Key Terms

**Citation:** A brief description of a resource placed within a piece of writing. A fuller description of the citation is found in a list at the end of the piece of writing. *Citation* and *reference* mean basically the same thing.

**Documentation:** The practice of giving the source (e.g., the book, article, internet) of something (e.g., a fact, opinion, or quotation) that you are using in your own writing.

**Other works consulted:** A list of resources you used when researching your paper but did not cite in the paper. (Not all papers will have this list.) Use the same style as for the Works Cited list.

**Works cited:** The list of resources cited in a piece of writing when using MLA style documentation. Other documentation styles call this list "References" or "Bibliography."

A research paper must follow the documentation style of an official style guide. In this book, you are learning to use the documentation style of the Modern Language Association (MLA). It is true that college students or college teachers and researchers who write STEM research papers do not use MLA style documentation (see Chapter 3, page 40, footnote, for my reasons for choosing this style). In college, you will most likely use the American Psychological Association (APA) style of documentation or one more specific to your field. For example, the field of physics commonly uses the American Institute of Physics (AIP) style manual, the fields of chemistry and environmental science use the American Chemical Society (ACS) style manual, and the medical field uses the American Medical Association (AMA) style manual. NSTA Press, the publisher of this book, uses the *Chicago Manual of Style.*

I am introducing you to the general principles of documentation. You should find it easy to transfer the basics of what you learn here to any other documentation style.[*] You will find more information about MLA style and other official documentation styles at the following sites:

- Purdue Online Writing Lab (OWL) *http://owl.english.purdue.edu/owl/resource/747/01/*

- Noodle Bib *www.noodletools.com*

- Study Guide *www.studyguide.org/MLAdocumentation.htm*

There are several important general principles of documentation. The most important is that you give credit to the ideas, information, or expressions of other people in two places within your scientific paper or poster: the narrative (the essay part) of your writing and in a reference list (called Works Cited here) at the end of your paper. All documentation styles require in-text citations. *Any sentence in your paper that comes from ideas you got during your background research*

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[*] The MLA instructions provided in this chapter and elsewhere in the book are based on the seventh edition of the Modern Language Association's style handbook (*MLA handbook for writers of research papers.* 2009. New York: Modern Language Association of America).

*must have an in-text citation.* In MLA style, you put the author(s) name(s) and page number(s) (i.e., the pages where the idea or quote appeared) within parentheses: (Smith 124).

The in-text citation is a signal to your reader to refer to the Works Cited list so that he or she has a way to obtain the source you cited. As noted earlier, in MLA style documentation, the list of resources at the end of your paper is called a Works Cited list. Any resources that you used but did not cite in your paper can be put into an Other Works Consulted list.

# Three Aspects of MLA Documentation

The box to the right gives you the five general principles of documentation. Now let's move on to the specifics of MLA style documentation.

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## General Principles of Documentation

### (Rules That Apply No Matter What Documentation Style You Are Using)

- Place an in-text reference within the narrative in parentheses. Put it at the end of a sentence or sentences that contain ideas from other sources, such as books or journals.

- Include complete information about the source in a Works Cited list/bibliography/reference list.

- Alphabetize that list by the author's last name.

- In-text references must be listed in the Works Cited list, and the entries in the Works Cited list should be cited somewhere in the paper. Needless to say, the spelling of an author's name within the text and in the Works Cited list must match!

- Punctuation, spacing, and abbreviations of in-text citations as well as the reference list are important and specific to each documentation style.

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## 1. Citing Sources Within the Paper (Author Last Name and Page Number)

Citing your sources within the text of your paper means inserting citations in parentheses right after the idea or quote you borrowed from another source. There are two primary ways to document or cite sources, but both must include the author's last name(s) *and* page number.

- Put the author's last name and the page number in parentheses after the sentence where you used the source. This information should all be in your notes (see Chapter 3, pp. 35–36). It is not a good idea to write the paper first, with the intention of going back and inserting the in-text citations later. Include them as part of the writing process, not later when there is an increased chance that you might not accurately cite your references (or maybe forget to cite them altogether!).

- Punctuation, spacing, and abbreviations are very important when making in-text parenthetical citations. In MLA style documentation

(Figure 10.1), there is one space between the last word in the sentence and the opening parenthesis. However, there is no space between this parenthesis and the first letter of the author's last name. Insert one space between the last letter of the author's last name and the page number. Notice that there is no abbreviation of the word *page*—only the number by itself. After you close the parenthesis directly after the page number, put the punctuation for the entire sentence *after* the closing parenthesis. (*Note:* These rules may seem incredibly picky, but if they aren't followed consistently throughout your paper, the paper will look sloppy and unprofessional.)

- Mention the author's last name inside the sentence and place only the page number(s) of the source in parentheses (see Figure 10.2). If the work you are citing has no known author, use either the complete title or a short form of the title of the book or article within the parentheses. If you are using a book title or article title instead of an author, remember that book titles should be *italicized* and titles of articles are put in "quotation marks." The first letter of what you put in parentheses (not counting *A, And,* or *The*) determines where that entity will appear in the (alphabetized) Works Cited list. If the work you are citing has more than one author or you run into other documentation issues (and you probably will), check the MLA style handbook itself if your teacher has a copy or go to *http://owl.english. purdue.edu/owl/resource/747/01.*

## Figure 10.1

**MLA Style Citation With Author's Name at End of Sentence**



There is no space between the parenthesis and last name.

The punctuation for the sentence goes AFTER the parenthesis, not before.

Geotropism is a response to gravity (Keeley 80).

These words came from ideas that originated from the source at the end of the sentence.

Put one space between the last word in the sentence and the parenthesis.

Author's last name

Page number
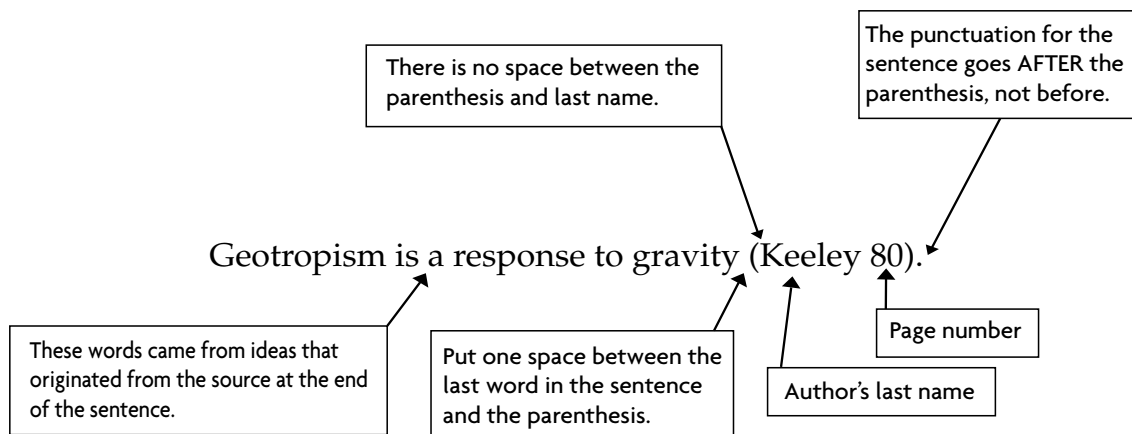
## Figure 10.2

**MLA Style Citation with Author's Name Inside the Sentence**

Keeley notes that only multicellular organisms can produce eggs (118).

Author's last name is used as the subject of the sentence.

Name left out of parentheses and only page number remains.

Punctuation is still after the parenthesis.
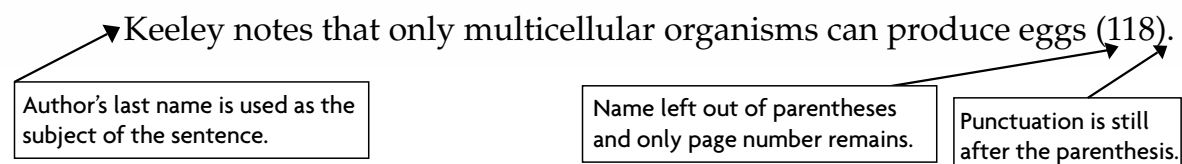
## 2. The Works Cited List

The second part of documentation is the creation of the Works Cited list. This list includes all the resources you cited in your paper. Below are the basics of how books, journals, and online resources should be formatted on the Works Cited page. Use the same formatting if you have an Other Works Consulted list.

### Book With One Author

Last name, First name. *Title of Book.* Place of Publication: Publisher, Year of Publication.

**Example:** West, Herbert. *Forms of Energy.* New York: Rosen Publishing Group, Inc., 2009.

### Book With More Than One Author

Last name, First name, First name Last name, and First name Last name. *Title of Book.* Place of Publication: Publisher, Year of Publication.

**Example:** Silverstein, Alvin, Virginia Silverstein, and Laura Silverstein Nunn. *Matter.* Minneapolis: Twenty-First Century Books, 2009.

### Article in a Magazine or Journal

Last name, First name. "Title of article." *Title of Magazine or Journal* Volume.Issue (Year): pages

**Example:** Ruxton, Graeme D. "Zoology: Why are whales big?" *Nature* 469.7331 (2011): 481.

### Entire Website/Editor, Author, or Compiler (If Available)

Editor, author, or compiler name [if available]. *Name of Site.* Version number. Name of institution/organization affiliated with the site [sponsor or publisher], date of resource creation

[if available]. Medium of publication [i.e., print or web]. Date of access. [URL if required by your teacher]

**Example:** Jones, John. *How Stuff Works.* Discovery, 1998. Web. 10 Oct. 2011.

### *A Page on a Website/No Editor, Author, or Compiler Available*

"Title of Article/Webpage." *Name of Site.* Version number. Name of institution/organization affiliated with the site [sponsor or publisher], date of resource creation [if available]. Medium of publication [i.e., print or web]. Date of access. [URL if required by your teacher]

**Example:** "How Do Flies Breathe?" *How Stuff Works.* Discovery, 22 Jan. 2001. Web. 31 March 2011.

When typing up your Works Cited list, remember these basics:

- The Works Cited list should have the same 1 in. margins as the rest of the paper and be numbered consecutively with header formatting to match the rest of the paper.

- Note the *punctuation* in the MLA Works Cited because its placement is significant. Every period, comma, colon, and space is important.

- Longer works, such as books and magazines, are *italicized.* Shorter works, such as articles, are put in "quotation marks."

- The words Works Cited are centered on the first line of the page. Don't use any fancy fonts, quotation marks, italics, bolding, or underlining.

- Alphabetize the Works Cited by author's last name. If there is no author, alphabetize by the first major word in the title of the work. Never alphabetize by articles like *a, and,* or *the.*

- The entire Works Cited is double-spaced, with what is called a *hanging indent.* This means that the first line of the entry is aligned with the left margin, but if the entry is more than one line, then the following lines are indented five spaces or about ¼ in. (the line that is indented is the "hanging indent"). Making the indent allows the author's name to be seen easily.

## 3. Matching Paper Citations With the Works Cited

Your final step regarding documentation is to make sure that the in-text citations that are in parentheses match the references in the Works Cited list. Your

reader should be able to quickly flip from the mention of resource in the text to the Works Cited list to find complete information about the resource.

# Amount of Documentation and Use of Quotations

You may wonder, as students often do, just how much documentation to use in a research paper. Most teachers would prefer that you "over document," rather than "under document." When in doubt, by all means insert another in-text citation. Ideally, you should have at least two different resources backing up your points in every paragraph. (I emphasize different because if you depend too heavily on one resource per topic, your reader might question the authenticity of what you're saying and think, *Only one person seems to believe that. Maybe it's just that person's opinion and isn't really factual*.)

A quotation, or direct quotation, is the use of the *exact words* from a resource. Use quotations sparingly. When you use them, don't let them stand alone without some explanation or discussion by you. Show the reader that you used the quotation to support an idea you are trying to get across. (See pp. 48–49 for more information on how to use quotations in your paper.)

# Research Paper Setup

## The First Page of the Paper

In MLA style, there is no separate title page. The actual (written) paper begins on the first page after you follow these four steps:

Step 1. On the first page, put the following information in the upper left-hand corner, double-spaced.

- Your full name

- Teacher's name

- Course name

- Due date

Step 2. On the first page, double-space and center the title of your paper. Don't put it in quotation marks or bold face and don't use all capital letters.

   **Example:** The Effects of Glucose on Cell Volume

Step 3. Plan to put the "header" or "running head" in the upper right-hand corner of every page. It should your last name and page number, with a space in between: Harland 12

Step 4. Plan to double space the entire paper. Be sure to never hit the return twice between section headings or between references listed in your Works Cited. The margins should be set to 1 in. on all sides. (Be careful: Often word processing programs have a 1.25 in. default setting). The font should be Times New Roman or Arial in 12 point size, with no other fonts used anywhere in the paper.

NOW, you begin the text of your paper, double-spaced under the title.

## Subdivisions Within the Paper

Subheadings should be *centered*. Use the same font and type size as for the rest of the paper (and, again, no bold, underling, italics, or all capitalization). Each heading should be followed by at least two paragraphs within them.

## Formatting the Works Cited

The entire page is double-spaced, with the first line of each entry being left-justified and any following lines allowing a hanging indent of five spaces, or ¼-in. The entries are not numbered. They are listed in alphabetical order by author's last name or first main word in title. Follow the same format for you Other Words Consulted list, if you have one.

## Tables and Figures

According to MLA style documentation, all graphics inserted into papers are divided into two categories; tables or figures. Both tables and figures must remain within the 1 in. margin of the paper. (*Note:* All tables and figures must be referred to in the text. Also, the tables and figures should be numbered separately—Table 1, Table 2, etc.; Figure 1, Figure 2, etc. This means that it would be possible, for example, to have both a Table 4 and a Figure 4 on the same page.)

### *Tables*

Your STEM research paper may include tables that display experimental data or statistical results. You will probably construct tables either within the word-processing program you are using or by copying and pasting from a spreadsheet program. It is important to place the table as close to the text to which it relates. Each table is titled: Use the word *Table* and its assigned number on the first line and then a descriptive title on the second line. The lines are aligned at the left and double-spaced. The numbered table head and its title are placed *above* the table in the paper (not under the table as is the case for figures) and left justified. For example:

Table 6

Comparison of Some Physical Properties of Carbon Allotropes

*Figures*

In MLA style documentation, all visuals or graphics that are not classified as a table are considered figures. For your STEM research paper, figures might include any graphs of your experimental results or photographs you are choosing to include. Each figure is labeled "Figure," its assigned number, and a descriptive title. For example:

Figure 4. *E. coli* Growth Within Varying Concentrations of Streptomycin.

The figure label goes under the figure, unlike the table label, which goes above the table.

# Chapter Questions

1. What is documentation and why is it important?

2. What basic documentation guidelines apply to all documentation styles?

3. Describe the connection between in-text citations and the Works Cited list.

# Chapter Applications

This chapter provided enough background on how to use the MLA style documentation to get you started in correctly formatting your resources during the background research phase. While you take notes, use the MLA Works Cited section in this chapter (p. 151) to format resources on bibliography cards, notebook pages, or online. Once you are ready to begin writing and formatting your paper or poster, use this chapter in conjunction with the three MLA style documentation resources listed on page 148. Remember to insert in-text citations as you write, not after, and to match the citations to the Works Cited list.

Before you can actually begin writing, however, you will need to organize your STEM research paper into the standard scientific journal form. The next chapter will show you how.