



- iii. Demonstrate that the design meets each of the design criteria established at the beginning of the project. What needs to be changed and retested? Test results may be included in tables, if applicable. Data analysis may also be a part of this step.
- vii. Results:** Your report should provide all the information necessary for someone who is unfamiliar with your project to understand what you were trying to accomplish, how you did it, and whether you succeeded. The report should not only talk about your successful design attempts, but also the problems you encountered and how you solved them. Be sure to explain what new knowledge has been gained and how it leads to further questions. A clear, concise presentation of all the data accumulated as a result of the procedure, including data inconsistent with the design. All data is valuable. Drawings, charts, graphs, and other items pertinent to the project are important in conveying results and should be included. Caption all photographs. Label all drawings, charts, graphs. Include units of measurement. Always label axes of the graphs.
- viii. Conclusions:** A concise evaluation and interpretation of the data and results. Opinions of the results may be expressed in this section. The conclusions should be limited to results of the investigation and should refer to the stated established design criteria. The effects of experimental error should be estimated and considered while drawing conclusions.
- ix. Reference List:** A list of at least 12 published articles, books, and other communications, including works either quoted or paraphrased that are actually cited in the Review of Literature. Use the format described in the *Publication Manual of the American Psychological Association*, 6th ed. (APA style). The reference list should be presented alphabetically by author's last name and should be placed at the end of the paper. The correct style for listing references can be found on pages 30-33 of this Handbook.

## Writing conventions

The Research Summary should be written according to the information in this handbook. A clear and concise presentation is important in scientific communication. Use short, simple sentences in the third person point of view to clearly explain the project. Facts should be grouped logically without being repeated needlessly. The 30 page limit is adequate when this is done well. The paper should be well-typed, without errors in spelling, grammar, punctuation.

Be sure to include all necessary information without going beyond the section guidelines above. Have the Research Summary proofread to help ensure the guidelines have been followed consistently throughout the paper.

## Paper layout

**The Research Summary must be typed, using double spacing, on only one side of each sheet of paper**, using a standard font and size, such as Times New Roman and 12-point font size.

A margin of 2.5 cm (1") must be maintained on the left and right sides, top, and bottom of each page. All pages must be numbered and referenced in the Table of Contents.

The *Title Page of the Research Summary* must be formatted as shown on page 56. The signature of the sponsoring teacher and the school coordinator as well as the student's name, address, zip code, school, and grade must be positioned as shown in the example.

**The student's last name and the title of the project must be typed at the upper right-hand corner of each page after the Table of Contents. Each page should have the student's last name and title of the paper at the top right (Example, Smith: *The Effect of Sunlight on Plants*). Use the last name of the first student listed on the Abstract.**

Exhibitors are required to have **nine** copies of the *Science Research Summary*. *Duplicating services will not be provided for those lacking the required number of copies. Students must have the required number of copies when they report to the museum. Of this number, eight copies are to be submitted to the Judging Committee and one copy is to be retained at the exhibit site.* The student should always retain the original copy.

Use the Checklist for the Physical Arrangement of the STEM Research Paper on pages 57-58 before submitting the paper.



## Reference List Format

The correct style to use for citing references in the Reference List section is discussed in detail in the most current *Publication Manual of the American Psychological Association, 6th Edition* (APA style). Be careful to follow the exact punctuation, indentation, and format shown in the samples. The Reference List must be double-spaced. Note: If using the *APA Publication Manual*, all *example* references are single-spaced to save space in the *Publication Manual*. The Reference List should be alphabetized according to the first letter of each entry. Entries should be formatted using a hanging indent. Entries should begin flush left and the second and all subsequent lines should be indented. Italics are preferred over the use of underlining. The abbreviation for Page(s), p. or pp. is not used except in references to newspapers. Electronic sources must provide the date the information was retrieved, and also the name and/or address of the source.

The following are examples of how to cite a reference in the *Review of Literature*

1. One method of citing a direct quote in the research paper should be in the form: She stated, “The ‘placebo effect,’ which had been verified in previous studies, disappeared when behaviors were studied in this manner” (Miele, 2001, p.276), but she did not clarify which behaviors were had been studied.
2. A paraphrasing of the text should be in one of the following forms:-as Smith (2002) demonstrated...  
-as has been demonstrated (Smith, 2002).

## Sources of Information

### ▼ Books

#### **Book - One author:**

Arnheim, R. (2001). *Art and visual perception*. Berkeley, CA: University of California Press.

#### **Book - Multiple authors:**

When a work has between two and six authors, cite all authors. When a work has more than six authors cite the first six authors followed by “et al.” to indicate the remaining authors.

Festinger, L., Riecken, H., & Schachter, S. (2003). *When prophecy fails*. Minneapolis: University of Minnesota Press.

West, S., Sandler, I., Tein, J., Ivy, P., Patterson, H., Roeder, K., et al. (2001). *Nerve cells and insect behavior*. Cambridge, MA: Harvard University Press.

#### **Book- Corporate author:**

Institute of Financial Education. (2001). *Managing personal funds* Chicago: Midwestern Publishing.

#### **Book - Edited volume:**

Maher, B. A. (Ed.). (2003). *Progress in experimental personality research*. New York: Academic Press.

Letheridge, S., & Cannon, C.R. (Eds.). (2001). *Bilingual education: Teaching English*

#### **Book - No author:**

*Experimental psychology*. (2004). New York: Holt.

#### **Book - Work in an anthology:**

Rubenstein, J. P. (2003). *The effect of television violence on small children*. In B.F. Kane (Ed.),

*Television and Juvenile Psychological Development* (pp. 112-134). New York: American Psychological Society.

### ▼ Journals-Magazines-Newspapers

#### **Articles in journals or magazines with continuous pagination:**

Passons, W. (2001). Predictive validities of the ACT, SAT, and high school grades for first semester GPA and freshman courses. *Educational and Psychological Measurement*, 27, 1143-1144.

Posner, M.I. (2000, October 29). Seeing the mind. *Science*, 262, 673-674.



### **Articles in journals or magazines with non-continuous pagination:**

Because pagination begins anew with each issue of the journal, it is necessary to include the issue number in italics followed by the volume number in parentheses, if applicable. Note that there is a comma between the issue number and the page numbers, but no comma between the italicized volume number and the issue number.

Sawyer, J. (2003). Measurement and prediction, clinical and statistical. *Psychological Bulletin*, 66(3), 178-200.

Mellers, B. A. (2005). Choice and consequences. *Psychological Bulletin*, 126, 1040-1049.

### **Daily Newspaper article:**

Schwartz, J. (2005, September 17). Urbana firm obstacle to office project. *The Champaign-Urbana News-Gazette*, pp. A1, A4, A9-11.

### **Daily Newspaper article (no author):**

President Clinton puts 'human face' on health-care plan. (2002, September 6). *The New York Times*, p. B14.

### **Articles in weekly periodicals:**

Kauffmann, S. (2005, October 18). On films: class consciousness. *The New Republic*, p.30.

### **Articles in monthly periodicals:**

Chandler-Crisp, S. (2003, May). Aerobic writing: A writing practice model. *Writing Lab Newspaper*, pp. 9-11.

## **▼ Other Sources**

### **Encyclopedia:**

Photosynthesis and plants. (2004). *Encyclopedia Americana* (Vol. 22, p. 453).

New York: Americana Corporation.

### **Entry in an Encyclopedia:**

Wagner, D.H. (2002). Relativity. In *The new encyclopedia Britannica* (Vol. 26, pp. 501-508). Chicago: Encyclopedia Britannica.

### **Encyclopedia article, CD-ROM:**

#### **Basic form**

Author/editor (if given). (Date). Title of material accessed. In *Source*. Retrieved Publication medium, *edition or version (if relevant)*. Location: Name of Producer.

#### **Example with author:**

Daniel, R. T. (2003). The history of Western music. In *Britannica Online: Macropaedia*. Retrieved CD-ROM. Carlsbad, CA: Compton's NewMedia, Inc.

#### **Example without author:**

Genetic engineering. (2001). In *Compton's Interactive encyclopedia, Version 2.0*. Retrieved CD-ROM. Carlsbad, CA: Compton's NewMedia, Inc.

### **Film or videotape:**

Weir, P.B. (Producer), & Harrison, B.F. (Director). (2003). *Levels of consciousness* [Videotape].

(Available from the American Psychological Association, 750 Second Street, Boston, MA 73002-4224).

### **Interviews – Published:**

Archer, N. (2004). [Interview with Helen Burns, author of *Sense and Perception*] *Journal of Sensory Studies*, 21, pp. 211-216.



### **Interviews- Unpublished:**

Unpublished interviews do not need a reference page entry because they are what the Publication Manual of the APA calls “personal communications” and so “do not provide recoverable data.”

Davis, N. (2003, October 11). Personal interview.

### **Recording:**

Shocked, M. (1992). Over the waterfall. On *Arkansas traveler* [CD]. New York: PolyGram Music.

## ▼ **Electronic Sources**

Electronic formats can be found at: <http://www.apa.org/science/pubs.html>

### **World Wide Web, Home page/Secondary page:**

#### **Basic form**

Author/editor (if known). (Revision or copyright date, if available). Title of page. Publication, Page number(s). Retrieved Date, from Protocol: Site/Path/File

#### **Example**

Goizueta, R. C. Annual report to share owners. Coca-Cola Newsletter, 1- 23. Retrieved October 13, 2005, from <http://www.cocacola.com/co/chairman.html>

### **Periodical – Electronic:**

#### **Basic form**

Author, A. A., Author, B. B., & Author, C. C. (2000). Title of article. *Title of Periodical*, *xx*, xxxxxx. Retrieved month day, year, from source.

### **Journal article - Electronic:**

#### **Basic form**

Author. (Date). Title. *Journal Title*, *volume*, paging. Retrieved Date, from URL

#### **Example**

Koehn, D. (2001). The ethics of handwriting analysis in pre-employment screening. *Journal of Applied Psychology*, *78*, 443-449. Retrieved October 9, 2001, from PsycARTICLES database.

### **Magazine article - Electronic:**

#### **Basic form**

Author. (Date). Title. *Magazine Title*, *volume* (if given), paging. Retrieved Date, from URL  
Protocol: Site/Path/File

#### **Example**

Rosner, H. (2003, March 4). Will e-mail become j-mail? *Brandweek* *37*, 30. Retrieved from ABI/INFORM. <telnet://melvyl.ucop.edu>

### **Daily Newspaper article – Electronic:**

#### **Basic form**

Author. (Date). Title. *Newspaper Title*. Retrieved Date, from URL Protocol: Site/Path/File

#### **Example**

Markoff, J. (2005, June 5). Voluntary rules proposed to help insure privacy for Internet users. *New York Times*. Retrieved November 21, 2006 from <http://www.nytimes.com/library/cyber/week/y05dat.html>



## **Newsgroup article - Electronic:**

### **Basic form**

If the author's name is available list it last name first. If only a screen name is available, use the screen name. Provide the exact date of posting. Follow the date with the subject line of the message. Do not italicize it. Provide any identifier for the message in brackets after the title. Finish the reference with *Message posted to* followed by the address of the newsgroup. Note that the protocol is *news*.

Author (if given). (Date). Subject line of message. Message posted to news://Protocol:Topic.Subtopic(s)

### **Example**

Chalmers, D. (2000, November 11). Seeing with sound [Msg 1]. Message posted to news://sci.psychology.consciousness

## **Personal communication - Electronic:**

### **Basic form**

Communicator (personal communication, Date)

### **Example**

Omar, B. W. (personal communication, June 5, 2005)

## **APA Resource Websites**

These materials will introduce you to APA documentation, step-by-step instructions, Format, Citations, and Reference Lists.

<http://www.apastyle.org/apa-style-help.aspx>

<http://www.apastyle.org/learn/quick-guide-on-references.aspx#Websites>

<http://www.stylewizard.com/apa6index.html>

<http://www.noodletools.com>

<http://www.easybib.com>

<http://www.rapidcite.com>

<http://www.citationmachine.net>

<http://www.wisc.edu/writing/Handbook/DocAPA.html>

<http://www.cws.illinois.edu/workshop/writers/citation/apa/index.html>

<http://www.zotero.org/>

<http://citationmachine.net/index2.php>