

Science Fair - Background Literature Review(Research Paper)

Background research is an essential part of a research project. Working scientists read what other researchers have written (literature) before they begin a set of experiments. All scientists build on the knowledge of other scientists. They use their literature review to understand their topic better and to know how to put their own results in context. The more they understand their topic the better they can design a useful experiment. The purpose of the Background Research Report is for you to gain knowledge about your Science Fair Project topic. This way you will be able to interpret the results of your experiment and draw conclusions based on the previous knowledge you gained by writing this report. This report should NOT be your experiment plan/procedure; it should discuss information related to the topic you are studying. DO NOT provide the expected result of your experiment in this report. In the real world, scientists conduct experiments where no one truly knows the answer or the outcome. If everyone already knew the outcome of the experiment, the scientist wouldn't get paid to conduct it!

This literature review will help you become more knowledgeable about your science fair topic. You will eventually be writing a research paper describing your project, and this literature review will provide an important part of the Background section of your paper.

Your supporting paragraphs should discuss information about your experiment topic, but you should try to set up the need for your experiment. Pretend you are trying to convince Mrs. Williams that your experiment is needed and that you should get paid to do it. For example: "Although scientists understand much about how plants grow, plant anatomy, and the process of photosynthesis, it is still unclear whether pea plants will grow best in white light, red light, or green light. Optimal plant growth is important to provide enough food for a growing population and serve areas of the world where not enough food grows. Thus, this science fair experiment will test which color of light plants grow the best in."

What should you research about your topic?

- The history of your topic (who first studied it and when)
- The most up-to-date research on your topic. Who is currently studying in this field, what procedures are they using and what are they finding?
- The science behind any instrumentation or special techniques that you will use in your research
- Any chemical or mathematical formulas that are related to your project
- Any safety or special procedures you will need to employ (such as using aseptic technique for micro-organisms)

Find *five* sources that are relevant to your research topic, *ten* if it is a team project. State what your overall project idea is (in basic form state what you will be doing and what you will be measuring). Then summarize what you have learned from each of at least five sources and why this understanding is important for your project. I expect a summary of at least 3 typewritten pages from *each student*. Following your summary, include your works cited. Ensure that each source is correctly cited at the end of your review.

If you are a member of a team, list your team members at the top of your review. Team members may use identical sources, but their review must be independent and all sources must be included in the works cited section. *Identical reviews will be treated as plagiarism.*

No more than one of your five references may be a "pure" WWW citation (citations to an article that has been published *and* made available on the Internet are permitted). References should be individual articles or books that address your topic. You may have some references that provide a general background, but search for useful references that are *specific* to your topic. If your idea for a project came from a science fair project book is must be included but it is not one of your five required sources. Dictionaries and encyclopedias may also be used but also do not meet the criteria of the required sources. As you research information, you should be generating a works cited or bibliography.

- It should be in APA format
- It should include at least 5 sources/10 if you are part of a team.

Lastly, remember that scientific reports are always written in the third person. Do not use “my” or “I” in your writing. For example:

- 1) Instead of saying “My hypothesis is...”, you should say “The hypothesis of this experiment is...”
- 2) Instead of saying “This research report is about plant growth because plants are an important food source.” say “Plants are an important food source.”
- 3) Instead of saying: “I think there will be less plant growth in green light because...”, you should say “It is likely there will be less plant growth in green light because...”.

Science Fair Research Paper Requirements

APA Style

Format:

- Typed in 12 point font (This is a 12 point font). Times New Roman
- Double spaced
- Use only one side of each page
- One inch margins on all sides (top, bottom, left and right margins)
- Have a running head – a shortened form of your title – and the page number at the top of each of your pages (except the title page)
- Use formal language, for example, do not use “you,” “I,” or contractions

Your paper must be a MINIMUM of 3 pages for each student.

Title page – format presented in class, Name, title of paper,

Body pages.

- Introduction (Thesis statement, 1 paragraph, stating your topic)
- Body paragraphs (5+ paragraphs, explaining your topic in greater depth, examples of important research and researchers, current/up-to-date research)
- Conclusion (1 paragraph, summarize your research. Restate your thesis!)
 - o Graphs and charts do not count towards the page minimum
 - o Must contain at least two in-text citations from each source.

References

- This is where you indicate to the reader where you have gotten your information.
- Use APA format. Some examples are attached in the handout.

Giving Credit

There are two ways to give credit. One way is in your writing. This is an in-text citation. Your in-text citations refer to the references listed on your references page. If someone wanted to find out where you got your information, he or she could do so.

Writing a Bibliography: APA Format

Below are standard formats and examples for basic bibliographic information recommended by the American Psychological Association (APA). For more information on the APA format, see <http://www.apastyle.org>.

Basics

Your list of works cited should begin at the end of the paper on a new page with the centered title, *References*. Alphabetize the entries in your list by the author's last name, using the letter-by-letter system (ignore spaces and other punctuation.) Only the initials of the first and middle names are given. If the author's name is unknown, alphabetize by the title, ignoring any *A*, *An*, or *The*.

For dates, spell out the names of months in the text of your paper, but abbreviate them in the list of works cited, except for May, June, and July. Use either the day-month-year style (22 July 1999) or the month-day-year style (July 22, 1999) and be consistent. With the month-day-year style, be sure to add a comma after the year unless another punctuation mark goes there.

Underlining or Italics?

When reports were written on typewriters, the names of publications were underlined because most typewriters had no way to print italics. If you write a bibliography by hand, you should still underline the names of publications. But, if you use a computer, then publication names should be in italics as they are below. Always check with your instructor regarding their preference of using italics or underlining. Our examples use italics.

Hanging Indentation

All APA citations should use hanging indents, that is, the first line of an entry should be flush left, and the second and subsequent lines should be indented 1/2".

Capitalization, Abbreviation, and Punctuation

The APA guidelines specify using sentence-style capitalization for the titles of books or articles, so you should capitalize only the first word of a title and subtitle. The exceptions to this rule would be periodical titles and proper names in a title which should still be capitalized. The periodical title is run in title case, and is followed by the volume number which, with the title, is also italicized.

If there is more than one author, use an ampersand (&) before the name of the last author. If there are more than six authors, list only the first one and use *et al.* for the rest.

Place the date of publication in parentheses immediately after the name of the author. Place a period after the closing parenthesis. Do not italicize, underline, or put quotes around the titles of shorter works within longer works.

Format Examples

Books

Format:

Author's last name, first initial. (Publication date). *Book title*. Additional information. City of publication:
Publishing company.

Examples:

Allen, T. (1974). *Vanishing wildlife of North America*. Washington, D.C.: National Geographic Society.

Boorstin, D. (1992). *The creators: A history of the heroes of the imagination*. New York: Random House.

Nicol, A. M., & Pexman, P. M. (1999). *Presenting your findings: A practical guide for creating tables*.

Washington, DC: American Psychological Association.

Searles, B., & Last, M. (1979). *A reader's guide to science fiction*. New York: Facts on File, Inc.

Toomer, J. (1988). *Cane*. Ed. Darwin T. Turner. New York: Norton.

Encyclopedia & Dictionary

Format:

Author's last name, first initial. (Date). Title of Article. *Title of Encyclopedia* (Volume, pages). City of
publication: Publishing company.

Examples:

Bergmann, P. G. (1993). Relativity. In *The new encyclopedia britannica* (Vol. 26, pp. 501-508). Chicago:

Encyclopedia Britannica.

Merriam-Webster's collegiate dictionary (10th ed.). (1993). Springfield, MA: Merriam-Webster.

Pettingill, O. S., Jr. (1980). Falcon and Falconry. *World book encyclopedia*. (pp. 150-155). Chicago: World

Book.

Tobias, R. (1991). Thurber, James. *Encyclopedia americana*. (p. 600). New York: Scholastic Library

Publishing.

Magazine & Newspaper Articles

Format:

Author's last name, first initial. (Publication date). Article title. *Periodical title, volume number(issue number if available)*, inclusive pages.

Note: Do not enclose the title in quotation marks. Put a period after the title. If a periodical includes a volume

number, italicize it and then give the page range (in regular type) without "pp." If the periodical does not use volume numbers, as in newspapers, use *p.* or *pp.* for page numbers.

Note: Unlike other periodicals, *p.* or *pp.* precedes page numbers for a newspaper reference in APA style.

Examples:

Harlow, H. F. (1983). Fundamentals for preparing psychology journal articles. *Journal of Comparative and Physiological Psychology*, 55, 893-896.

Henry, W. A., III. (1990, April 9). Making the grade in today's schools. *Time*, 135, 28-31.

Kalette, D. (1986, July 21). California town counts town to big quake. *USA Today*, 9, p. A1.

Kanfer, S. (1986, July 21). Heard any good books lately? *Time*, 113, 71-72.

Trillin, C. (1993, February 15). Culture shopping. *New Yorker*, pp. 48-51.

Website or Webpage

Format:

Online periodical:

Author's name. (Date of publication). Title of article. *Title of Periodical*, volume number, Retrieved month day, year, from full URL

Online document:

Author's name. (Date of publication). *Title of work*. Retrieved month day, year, from full URL

Note: When citing Internet sources, refer to the specific website document. If a document is undated, use "n.d." (for no date) immediately after the document title. Break a lengthy URL that goes to another line after a slash or before a period. Continually check your references to online documents. There is no period following a URL.

Note: If you cannot find some of this information, cite what is available.

Examples:

Devitt, T. (2001, August 2). Lightning injures four at music festival. *The Why? Files*. Retrieved January 23, 2002, from <http://whyfiles.org/137lightning/index.html>

Dove, R. (1998). Lady freedom among us. *The Electronic Text Center*. Retrieved June 19, 1998, from Alderman Library, University of Virginia website: <http://etext.lib.virginia.edu/subjects/afam.html>

Note: If a document is contained within a large and complex website (such as that for a university or a government agency), identify the host organization and the relevant program or department before giving the URL for the document itself. Precede the URL with a colon.

Fredrickson, B. L. (2000, March 7). Cultivating positive emotions to optimize health and well-being. *Prevention & Treatment*, 3, Article 0001a. Retrieved November 20, 2000, from

<http://journals.apa.org/prevention/volume3/pre0030001a.html>

GVU's 8th WWW user survey. (n.d.). Retrieved August 8, 2000, from

<http://www.cc.gatech.edu/gvu/usersurveys/survey1997-10/>

Health Canada. (2002, February). *The safety of genetically modified food crops*. Retrieved March 22, 2005,

from http://www.hc-sc.gc.ca/english/protection/biologics_genetics/gen_mod_foods/genmodebk.html

Hilts, P. J. (1999, February 16). In forecasting their emotions, most people flunk out. *New York Times*.

Retrieved November 21, 2000, from <http://www.nytimes.com>

SAMPLE APA Bibliography

References

Booth, S.A. (January 1999). High-Drain Alkaline AA-Batteries. *Popular Electronics*, 62, 58.

Dell, R. M., and Rand, D.A.J. (2001). *Understanding batteries*. Cambridge, UK: The Royal Society of Chemistry.

Devitt, T. (2001, August 2). Lightning injures four at music festival. *The Why? Files*. Retrieved from

<http://whyfiles.org/137lightning/index.html>

Dove, R. (1998). Lady freedom among us. *The University of Virginia Alderman Library Electronic Text*

Center. Retrieved from <http://etext.lib.virginia.edu/subjects/afam.html>

Fredrickson, B. L. (2000, March 7). Cultivating positive emotions to optimize health and well-being. *Prevention*

& Treatment, 3, Article 0001a. Retrieved from <http://journals.apa.org/prevention/volume3/pre0030001a.html>

Health Canada. (2002, February). *The Safety of Genetically Modified Food Crops*. Retrieved from

http://www.hc-sc.gc.ca/english/protection/biologics_genetics/gen_mod_foods/genmodebk.html

Hilts, P. J. (1999, February 16). In Forecasting Their Emotions, Most People Flunk Out. *New York*

Times. Retrieved from <http://www.nytimes.com>