

Part I: Using a Scientific Literature Database and Creating a Bibliography

Purpose: Students will learn to use a scientific database in order to locate primary literature pertinent to a specific topic and to practice selecting appropriate articles for a research paper. Students will also practice creating bibliographic entries.

Introduction: You have learned that scientists communicate new discoveries and important results in research articles (primary literature) that are published in scientific journals and other sources.

In addition to primary literature, scientific journals also often contain **review articles**, which are articles that summarize the primary literature regarding a specific topic and typically attempt to use primary research from different research groups, different times, or even different sub-disciplines together into a coherent discussion about the topic. These articles are also meant to help direct a reader to the most pertinent primary literature in that area. Reading a review article is often the best way to introduce yourself to a particular topic. Although it can be tempting to cite a review article, you should read and cite the appropriate primary literature whenever possible.

There are hundreds, if not thousands of scientific articles published each month in scientific journals. Because keeping up with the entire body of primary literature would be nearly impossible for a researcher, many scientific journals are indexed in searchable **databases** so that scientists can easily find articles of interest. When beginning a literature search it is important to think about which databases you will want to search. In the life sciences, Web of Science, ScienceDirect, and PubMed are commonly used databases to which Creighton subscribes and which be accessed from the Library webpage <<http://ralresearch.creighton.edu/titles>>.

When searching a database, you can use any information that is known about an article as a **search term**. Articles are typically searchable by author, article title, journal title, year published and by **keyword**. When you first begin a search on a particular topic, you will almost always start with a keyword search. When choosing appropriate keywords, you should use the most specific keywords you can in order to narrow your search results to the most pertinent articles. Otherwise, you may get too many articles to sort through. Let's look, for example, if you are interested in writing about reptile behavior in the presence of predator. A search on *Web of Science* using the keyword "behavior" has 1,582,041 results, whereas a search for "reptile" AND "behavior" has only 1,013 results. This is still way too many articles to read, so you might narrow your search even more using the words "reptile" AND "behavior" AND "predator" which results in a set of only 138 articles. You could further narrow this by choosing a particular reptile group, like anoles or geckos, or narrowing the time period in which you are looking.

Your lab TA will now guide you through a variety of exercises designed to familiarize you with using the Web of Science database. You will learn how to search the database using different types of data, and how to use *Web of Science* features to narrow your search and manipulate your search data. Although these exercises are specifically for *Web of Science*, many of the same tools and techniques are applicable to any database.

Searching a Database:

The Web of Science database is part of the larger Web of Knowledge database. To access this database, go to the Reinert Alumni Memorial Library webpage <<http://www.creighton.edu/reinert/index.php>>. Some databases are listed on the front page, but to get to Web of Science, click on the **All Databases A-Z** link. On the database page, click on the **W** tab and then find the link to **Web of Science** second from the top. Click on that link, which should take you to the search page that looks like the image below.

Search

The screenshot shows the search interface with three search boxes. The first box contains the text "Example: oil spill* mediterranean" and has a dropdown menu set to "Topic". The second box contains the text "Example: O'Brian C* OR OBrian C*" and "Need help finding papers by an author? Use [Author Finder](#)." and has a dropdown menu set to "Author". The third box contains the text "Example: Cancer* OR Journal of Cancer Research and Clinical Oncology" and has a dropdown menu set to "Publication Name".

On the Web of Science search page, you will see several blanks in which to enter search terms. To the right of these blanks, you will see drop down category menus. The default categories are “topic”, “author”, and “publication name.” To change the category, simply click on the arrow to see the full list and use your mouse to select the desired category.

1. What are three search categories other than “topic”, “author”, and “publication name” utilized by Web of Science that you might find useful?

- 1.
- 2.
- 3.

You can use more than one search category to narrow down your search results. Let’s conduct a search for articles about Elephants that have been published in the journal *Science*. Type **Elephant** into the “Topic” box and **Science** into the box for “Publication name. Click on the orange “Search” Button.

Search

The screenshot shows the search interface with "elephant" entered in the Topic box and "Science" entered in the Publication Name box. The Author box is empty. The search button is orange.

Refine Results

Search within results for

▼ **Web of Science Categories**

MULTIDISCIPLINARY SCIENCES (65)

▼ **Document Types**

ARTICLE (24)

LETTER (13)

EDITORIAL MATERIAL (12)

NEWS ITEM (10)

BOOK REVIEW (5)

[more options / values...](#)

► **Research Areas**

► **Authors**

2. How many articles were returned?

Refining Results:

You can narrow now your results by choosing the document type you are interested in. On the left side of the screen on the results page you will see box entitled **Refine Results**, which includes a list of drop down menus. Click on the arrow by **Document Types** to see the drop down list and click on **Article**. This will restrict your results to primary articles and will remove any review articles, reports, or book chapters that were in the original list. If instead you checked the **Review** box (not visible in the screenshot), you would remove any primary literature and would see only the review articles.

You can further refine your results by typing in a keyword in the text box entitled **search within results for**. Type the word **diet** into this box and click on the **Search** button next to it. This will search within your *previous search* results for only articles that include the word diet.

3. What is the title of the first article that is returned?

Boolean operators and other search tools

Let's start a new search, this time using multiple keywords at once. Click on the **Search** tab at the top left corner of the Results page which will return you to the search page. Delete any text found in the search parameter boxes. This time, we will search for pollination of orchids. Let's start by using the words orchid and pollination as keywords for the Topic box. In the topic box, type **orchid AND pollination** and click on the orange **Search** button. In this case, AND is a **Boolean operator** that allows you to search for results with both words.

4. How many articles were returned?

You can use other words as Boolean operators. Return to the search page and this time, type in **orchid OR pollination** and click on the orange **Search** button.

5. How many articles were returned?

You should have returned many more articles because the results list will include articles that include either **orchid** or **pollination** as a keyword. Similarly, typing in **orchid NOT pollination** will return articles about orchids that do not have to do with pollination. Another handy tool Web of Science uses is the asterisk (*) for **truncation**. A search for **orchid*** will return results for orchid, orchids, and Orchidaceae (the plant family orchids are in). A search for **poll*** will return results for "pollen, and pollination, but also pollution, pollutants, and any other term that starts with the letters poll.

Quotation marks are another tool that we can use to narrow our results as they allow you to search for an exact phrase. Let's say we are interested only in moth pollination of orchids. Return to the search page clear topic search box. This time, type in **"moth pollination" AND orchids** with quotation marks around the phrase "moth pollination." The resulting article set will include articles that have the word orchid and the exact phrase "moth pollination" as keywords.

Search

in
Example: oil spill mediterranean*



Sorting Results:

Once you have a set of results, you can **sort** that by different parameters. The default sort is by publication date so that the most recent article is #1. Change the sort parameters by clicking on the drop down menu at the top right of the results page. Choose **Times Cited – highest to lowest** to sort the articles by the number of times they have been cited in other articles.

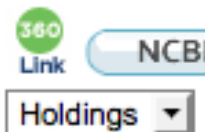
Sort by: Times Cited – highest to lowest

Obtaining bibliographic information and articles:

Once you have a set of articles on the results page, you can read the basic bibliographic information. You should see on the front page, the title of the article, the first three authors, the title, volume, and issue of the journal in which the article is found, page numbers for the article, and the DOI or Digital Object Identifier. The DOI is a number assigned to objects in the digital environment that will never change, even if other web-based information does. In the last search we conducted (“moth pollination” AND orchids), sorted by times cited, the second article result should be an article by Clair Micheneau and colleagues from the journal *Annals of Botany*. Locate this entry.

2. Title: **Bird pollination in an angraecoid orchid on Reunion Island (Mascarene Archipelago, Indian Ocean)**
Author(s): Micheneau Claire; Fournel Jacques; Paillet Thierry
Source: ANNALS OF BOTANY Volume: 97 Issue: 6 Pages: 965-974 DOI: 10.1093/aob/m1056
Published: JUN 2006
Times Cited: 14 (from Web of Science)
 Link [ View abstract]

If you click on the title of this article, you will typically be able to read the **abstract**. This is a short summary of the article, usually 200-300 words, briefly describing the purpose, methods, and conclusions of the article. Reading abstracts is a fast way to tell if the paper will likely be useful to you or not. If you decide that an article will be useful to read, you will need to locate the full text of the article. A word of warning, even with the best keywords, not every article you return in a search will be pertinent to your research area. You must think critically about each article.



Many articles are now available online. To see if the above article is available, click on the green 320 Link button on the top left of the page. This button can also be found under the title on the Results page.

In the case of the Micheneau et al. article, this link takes you to a page where you can either view the full text of the article in HTML or download a PDF. You **must** download a .pdf version of any article you use in your bibliography. If you only look at the html version, you may not capture all the essential bibliographic information, such as page numbers.

For additional assistance using Web of Science, the database has several training exercises. Use the link pasted below or click on the **Access additional Training Resources** link on the right side of the Web of Science search page, under **Support, Tools, and Tips**. Scroll down to find the tutorials. The tutorials “Refine and Analyze Search Results” and “Search Tips for Web of Science” may be particularly helpful.
http://wokinfo.com/training_support/training/recordedtraining/

Formatting a Bibliography

Now that you know how to search a scientific database and locate research articles, you can locate article on any topic of interest. You will be required to locate articles on a subtopic of this year’s paper topic theme, which you will later use in writing a 1500 word research paper.

There are two important tasks to master when creating a bibliography (1) choosing appropriate articles to include and (2) including the appropriate information about each article in the correct format. In this course, you will use the following format for a bibliography.

The style of formatting for a bibliography for a scientific article is different than MLA, APA, or other styles used in the social sciences or humanities. Failure to use the formatting style outlined below will result in a loss of points.

The information included in a bibliography entry includes the last names and initials of *all the authors*, the year of publication, the journal title, the journal volume, and the page numbers. For electronic articles that do not have page numbers, include the article number. Do not include the URL of the web search engine (e.g. PubMed or ScienceDirect, etc.) that you used to find the article.

In your bibliography, list the sources alphabetically by first author. For a given author, list those on which he or she is the single author first, then list papers that have two authors alphabetically by second author, then list papers with three or more papers alphabetically by second author. For papers with the exact same author or set of authors, list papers chronologically. Italicize the names of journals or of books.

Following, are the details on how to list different types of sources. Note that the citations within each section are organized in the correct order. Citations should be single spaced.

For a journal article, give: Author(s), year of publication, title of article, name of journal, volume of journal/issue or date of magazine, and page numbers.

Burk, T. 1982. Evolutionary significance of predation on sexually signaling males. *Florida Entomologist* 65: 90-104.

Burk, T. 1983. Behavioral ecology of mating in the Caribbean fruit fly, *Anastrepha suspensa*. *Florida Entomologist* 66: 330-344.

Burk, T. & C. O. Calkins. 1983. Medfly mating behavior and control programs. *Florida Entomologist* 66: 3-18.

Cullum, A. J., A. F. Bennett and R.E. Lenski. 2001. Evolutionary adaptation to temperature. IX. Preadaptation to novel stressful environments of *Escherichia coli* adapted to high temperature. *Evolution* 55: 2194-2202.

Taylor, M.L., T.D. Macfarlane and J.H. Williams. 2010. Reproductive ecology of the basal angiosperm *Trithuria submersa* (Hydatellaceae). *Annals of Botany* 106: 909-920.

Vinton, M.A. and E. Goergen. 2006. Plant-soil feedbacks contribute to the persistence of smooth brome (*Bromus inermis*) in tallgrass prairie. *Ecosystems* 9:967-976.

Vinton, M.A., D.C. Hartnett, E.J. Finck and J.M. Briggs. 1993. Interactive effects of fire, bison (*Bison bison*) grazing and plant community composition in tallgrass prairie. *American Midland Naturalist*: 129:10-18.

For a journal available only in electronic format: Author(s), year, title of article, name of journal, volume of journal, issue (if specified), and article number

Gross L. 2006. Demonstrating the theory of ecological speciation in cichlids. *PLoS Biology* 4(12): e449.

For a book: Author(s), year of publication, title of book, publisher and city (or country)

Friis E.M., P.R. Crane and K.R. Pedersen. 2011. Early flowers and angiosperm evolution. Cambridge University Press, UK.

Grier, J.W. and T. Burk. 1992. *Biology of Animal Behavior*, 2nd ed. Times-Mirror/Mosby: St. Louis.

For an edited book (containing a collection of papers or chapters by different authors): Author(s), year of publication, title of chapter, title of book, editor(s), publisher and city

Burk, T. 1983. Male aggression and female choice in a field cricket: the importance of courtship song. In *Orthopteran Mating Systems: Sexual Competition in a Diverse Group of Insects*, ed. by D.T. Gwynne and D.K. Morris. Pages 97-119. Westview Press: Boulder.

Osborn, J.M. and M.L. Taylor. 2010. Pollen and coprolite structure in *Cycadeoidea* (Bennettitales): implications for understanding pollination and mating systems in Mesozoic cycadeoids. In *Plants in deep Mesozoic time: morphological innovations, phylogeny, and ecosystems*, ed. by C.T. Gee. Pages 34-49. Indiana University Press: Bloomington.

For a technical or government report: Author(s) if listed, otherwise name of reporting body, title of report, Name of reporting body if not already listed, editor(s) if listed, publisher and city if listed.

Hill A.L., C.A. Semeniuk, V. Semeniuk and A. Del Marco. 1996. Wetlands of the Swan Coastal Plain vol. 2a. Wetland mapping, classification and evaluation. Report, Water and River Commission Department of Environmental Protection. Western Australia.

Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: The Physical Science Basis, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Avery, M. Tignor and H.L. Miller (eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

For a online article that is not found in a scientific journal: Author(s), year, title of article, name of source, URL, and date published.

Stokstad, E. 2010. In Controversial Move, Antarctic Fishery Called “Sustainable.” *ScienceInsider*. <http://news.sciencemag.org/scienceinsider/2010/11/in-controversial-move-antarctic.html>. Published November 18, 2010.

For a web page (when material is not available in one of the above formats): Author(s) (if known), year of publication (if known), title of page, URL, date accessed.

University of Florida Institute of Food and Agricultural Sciences. 2001. Caribbean fruit fly – *Anastrepha suspense*. http://creatures.ifas.ufl.edu/fruit/tropical/caribbean_fruit_fly.htm. Accessed January 8, 2009.

Some general rules when bibliographic information is incomplete:

If the author or agency is not provided, cite by the first word or phrase of the title, followed by the year. In the bibliography, alphabetize that entry by the title rather than author. For example, if the first paper listed above had no author, it would be referenced as:

Evolutionary significance of predation on sexually signaling males. 1982. *Florida Entomologist* 65: 90-104.

If the date of publication is not provided, put “undated” for the year in both the citation and bibliography. If the second paper didn’t give a date, it would be cited as “(Burk, undated)” and referenced as:

Burk, T. Undated. Behavioral ecology of mating in the Caribbean fruit fly, *Anastrepha suspensa*. *Florida Entomologist* 66: 330-344.

Web sources, in particular, may have incomplete bibliographic information. This might result in a bibliographic entry such as

Asian Longhorned Beetle. Undated. <http://umw.uvm.edu/albeetle/>. Accessed January 7, 2009.

Topic Proposal and Annotated Bibliography (25 points)

You will now use what you have learned about searching for articles and formatting a bibliography to develop a topic proposal and create a bibliography that you will use later in the semester to write a 1500 word paper on an assigned subtopic of this year's paper theme: **Biomes**

The following steps may help you to complete this assignment.

1. By now, you have received your assigned topic via a message through BlueLine². These subtopic are still very broad and you will need to narrow the focus of your paper *within* your assigned subtopic. Begin by searching for general information about your sub-topic and look for particular subjects or examples that you find interesting.
2. Choose potential keywords for a database search; Enter those keywords into the database and continually refine your searches until you find articles that are pertinent to your subtopic or specific paper topic.
3. Read the abstract of articles that seem promising from their titles and keywords
4. Download the full text of articles that seem as though they may be helpful in writing a paper and skim them. If an article seems particularly helpful, analyze it carefully using the paper analysis skills you practiced earlier in the semester.
5. Continually refine your topic and database search using information you learn from the abstracts and articles that you read.
6. Ultimately, select the articles, books, and reports that you anticipate using to write your paper.
7. **Prepare a short statement** (2-5 sentences) that briefly describes the narrow topic on which you plan to focus your paper.
8. **Create a bibliography** using the formatting guidelines given above. At this stage you must have at **least 5 articles from the primary literature**.
9. **Annotate your bibliography**. Each annotation must include:
 - The DOI of articles accessed electronically or an indication that the source was print only.
 - An indication if the source is from the scientific literature and if it is, whether it is primary or secondary.
 - A **brief** description written in complete sentences of what the paper is about, what information you plan to get from the source and how you plan to use it to prepare your paper. To successfully annotate your bibliography, you must have read and analyzed the papers you include and have thought critically about the structure of your paper. Each annotation should be between approximately 50 and 150 words.
9. Submit your bibliography ONLINE using the **submit assignment** button on BlueLine². Your TAs will explain the online submission process to you.

Note: For a scientist, searching for and reading the scientific literature is an ongoing task. As you learn more about your topic and write your paper, you may find yourself searching for new articles.