**Finding Sources – How to Search the Literature**

**Resources**

Choosing suitable sources for any piece of scientific writing is important, because these sources will help add relevant detail to your writing. In any form of scientific writing, you would like your reader to know that you are credible and know what you are writing about; part of this credibility can be achieved by using reliable resources to find and cite scientific written work. Finding the most useful and relevant information to any scientific topic requires knowledge of which resources are available to you. Below is a list of many of these resources, along with helpful guidelines of how to use them.

* Use a [Research Guide](http://guides.library.ubc.ca/homepage). Research guides give you the ability to find specific sources for disciplines that you may not be familiar with.
* Use the [UBC Library Home page](http://www.library.ubc.ca/) to find articles, eBooks, theses and much more! The UBC library has subscriptions to a huge number of specialist journals that will house useful sources.
* [Google Scholar](http://scholar.google.ca/) is another great way to find the scientific information you need. You can access Google Scholar through the UBC Library website: [UBC library Home Page](http://www.library.ubc.ca) > Indexes and Databases > [Google Scholar](file:///C%3A%5CUsers%5CAnita%5CDocuments%5CUBC%5CTLEF%20Project%5CWebsite%20content%5C%E2%80%A2%09http%3A%5Cresources.library.ubc.ca%5Cpage.php%3Fdetails%3Dgoogle-scholar%26id%3D524), or directly at: <http://scholar.google.ca.>If you are on campus or sign in from home you can access the full-text of many articles that is not available publicly.
* [Web of Science](file:///C%3A%5CUsers%5CAnita%5CDocuments%5CUBC%5CTLEF%20Project%5CWebsite%20content%5C%E2%80%A2%09http%3A%5Capps.webofknowledge.com%5CWOS_GeneralSearch_input.do%3Fproduct%3DWOS%26search_mode%3DGeneralSearch) can be accessed through the UBC Library website: [UBC Library Home page](http://www.library.ubc.ca/) > Indexes and Databases tab > [Web of Science](http://resources.library.ubc.ca/page.php?details=web-of-science&id=138). This resource is basically a dedicated search engine, which you can use to find specific articles relevant to a topic you are writing about; there are many filters that can be added in your searches (such as ‘keywords’ and years of publication) to return very specific results.

**How can you keep track of all your references?**

* **Use** [**RefWorks**](file:///C%3A%5CUsers%5CAnita%5CDocuments%5CUBC%5CTLEF%20Project%5CWebsite%20content%5C%E2%80%A2%09https%3A%5Crefworks.scholarsportal.info%5Crefworks2%5CDefault.aspx%3Fr%3Dauthentication%3A%3Ainit%26groupcode%3Dubclibref)**!** Refworks can be accessed through the UBC Library website: [UBC Library Home page](http://www.library.ubc.ca/) > Indexes and Databases tab > [RefWorks and RefShare](http://resources.library.ubc.ca/?searchtype=keywords&search=refWorks+and+refshare)

**RefWorks** is an online **personal reference database** that allows you to import references from other online databases. RefWorks is useful because it creates citations for you, and in the style you need. As well, all references that you’ve looked up can be quickly imported to RefWorks for easy access in the future. Use RefWorks as a way to manage your references and easily incorporate relevant information into your scientific writing.

**Search Strategies**

To **maximize** the **effectiveness** of using the above **resources**, you must maximize your use of the search tools. Writing about science requires you to find and use credible sources (e.g. citing a source from 50 years ago might not be a wise move if the theory around the topic has moved on since then). There are many resources out there to help you, but searching can sometimes be overly time-consuming and ineffective. To more efficiently search and find applicable sources, use the strategies below. Keep practicing, and soon searching the scientific literature will seem less daunting!

**Maximizing effective use of resources**

 Check out the **Help section(s)** to understand exactly how each resource works and what/where it searches:

eg. 1) [Google Scholar](http://scholar.google.ca/): go to ‘[About Google Scholar’](http://scholar.google.ca/intl/en/scholar/about.html) at the bottom of the web page - this gives you an idea of what Google Scholar can do.

e.g. 2) [Web of Science](http://apps.webofknowledge.com.ezproxy.library.ubc.ca/WOS_GeneralSearch_input.do?product=WOS&search_mode=GeneralSearch): go to ‘[Help](http://images.webofknowledge.com.ezproxy.library.ubc.ca/WOKRS514B4/help/WOS/hp_search.html)’ at the top right hand side - this gives you an idea of how the Web of Science works.

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| **Ways to Expand Search** | **Ways to Narrow Search** |
| * Use the **Boolean operator ‘OR’** to expand search (use OR if you want mORe)
	+ e.g. Canine OR dog
	+ e.g. forests OR trees

Using ‘OR’ allows you to search synonyms or alternate terms for your concept. This allows the search engine to bring up articles with either of these words and articles containing both these words. It is useful to use ‘**OR’** because not every researcher will write using the exact same vocabulary. Using different terms allows for more search results to appear without eliminating potentially useful articles. Everything found in light and dark blue will appear in the search results; there have been no limitations set.  | * Use the **Boolean operator ‘AND’** to narrow search
	+ e.g. virus AND Aids

Using ‘**AND’** narrows down your search to something more specific. The search engine will pull up every article that includes both words. Only the articles represented by the darker blue section will appear, increasing the relevance of the list of search results. |
| * Use **Filters** for content type: articles, books, review paper etc
	+ e.g. search for ‘global warming’ – filter: peer-reviewed journal articles

If you would like a specific type of resource or written work, identifying this is a great way to minimize your search. As seen below, the search returns only what is found in the darker blue circle. |
| * Use **Snowballing**:

Take a look at the references at the end of an article, and skim those references next. The chances are high that you’ll find quite a bit of useful information in those references.  | * Use a **publication date limit:**
	+ e.g.Climate change - last five years

Setting a publication limit searches for the most up-to-date research. Many scientific theories and concepts are continually researched over time and new discoveries are made. It is important for your scientific writing to have new references to make your work more credible. Only work found in the darker blue section will appear in the list of search results. |
| * Use **truncation or wildcards**
	+ e.g. Canad\* finds Canad*a*, Canad*ian*, Canad*ians*

This type of search allows for many variations of the word to be searched. It maximizes the amount of articles that come up that may be related to your topic.  |
| * Use **“ ” phrase searching** - Used to narrow a search to a phrase of two or more words.
	+ e.g. “climate change”

Using this tool will search for the references which include these two words together. Those articles that do not contain both words together as they are written will not appear in the search. |
| * Use **keywords chunking** – search separately for each concept
	+ e.g. Bessel beam, optical trap

When each concept is separately searched, you will obtain all the references for both concepts, resulting in a greater span of written work. Again your results will provide all the articles on both of the separate concepts, as seen below. |
| * Use the **Boolean operator ‘NOT’:** use ‘NOT’ to remove words from your results
	+ e.g. Virus NOT Aids

By using the NOT operator, your results will be decreased. But use it cautiously, as you may omit useful results (perhaps only after you have viewed a long list and decided to narrow it down). In the sample below, only written work in the lighter - and not darker - blue will appear in your search..  |
| * Search by **scientific name** in addition to the **common name**
	+ e.g. pine beetles OR Dendroctonus ponderosae

Searching by both names will output all the references under this category. As seen below, all the written works that have either name will appear in the search results.  |
| * Search your topic by **document type**
	+ e.g. “aerosol particle”: title, abstract, or full text, etc.

Searching for a topic in a specific document type will narrow your search down to give something potentially more useful. Only the documents that have ‘aerosol particle’ in the title will result from the search. |

**Need more help?**

Watch ‘Grammar Squirrel’s video resources about [identifying different sources](https://www.youtube.com/watch?v=0207D87De7I) and [integrating them into your science writing](http://youtu.be/Z6ba9FVFAXg).