

Databases and Search Strategies

Databases

All databases consist of data (records) described in fields and a means by which to search these fields, a search engine. Databases may look different on screen but the underlying principles for searching and formulating search strategies are common to all.

Types of Databases

- ❑ Bibliographic databases: provide publication details of an item, but the item itself is not provided in the database. Information such as author(s), title, subject(s) and publisher is provided. The information provided is called a reference (or citation) and with this information you should be able to locate the item within the Library.
- ❑ Bibliographic with some full text content: these popular databases are indexes of journal articles with abstracts and often, but not always, include the full text of an article.
- ❑ Bibliographic databases with full text content: these databases include the entire full text for all articles and other documents indexed.

What is searched?

To make the records in a database searchable, the information contained within it must be indexed. There are variations in the way in which different database producers index their particular product, but the underlying principles are similar. In general terms, the procedure involves taking all the useful words from a field or part of a record and storing them in an index belonging to that field. Usually, individual words form the article title; author's name, subject terms (also known as keywords/subject headings), abstract and the full text of the article are indexed. These fields may be searched individually or in a 'keyword' search, across more than one 'field'. Phrases that combine two or sometimes three words may also be used e.g. **heart attack/myocardial infarction, in vitro fertilization, Asperger's syndrome etc.**

Creating a 'Search Strategy'

Before you can search for any information, you should first develop a search strategy. Think about the concepts that form the basic issues of your topic. Think about the keywords you will use. Consider possible synonyms e.g. car /automobile; alternative spellings e.g. sulphur/sulfur, labour/labor, organization/organisation and pediatric/paediatric; plurals and other endings.

- ❑ Define the search topic(s) and break it down into its component parts
- ❑ What terms, words or phrases do you use to describe the topic?
- ❑ What other terms might be used for this topic?

If you need ideas to help you think of terms to describe your topic:

- ❑ Use encyclopedias or handbooks for background information and terminology
- ❑ Look at words in the Catalogue records, from Subject headings, Contents, Notes

Think of possible changes in terminology when looking for older materials. These can be due to the development of a more technical vocabulary e.g. *tuberculosis* for *consumption*, to social changes e.g. *firefighter* rather than *fireman* and to changes in what is considered appropriate language e.g. *visually-impaired* rather than *blind*.

What's a Boolean?

Boolean logic takes its name from the British mathematician George Boole (1815-1864), who wrote about a system of logic designed to produce better search results by formulating more precise queries. He called it the 'calculus of thought.' From his writings, we have derived Boolean logic and its operators: AND, OR and NOT, which we use to link words or phrases for more precise searches. Using Boolean operators (AND OR NOT) will help focus and define your search. They can help broaden (increase) and narrow (decrease) search results. Boolean searching is an important skill to learn; you'll need these operators to effectively search the library catalogue, electronic databases and the Internet.

AND: Narrows a search because ALL TERMS must be present in each hit. It limits a search by requiring that the search terms before and after AND must both appear in the article for the article to be retrieved by the search process e.g. type **eating disorders AND children** to find results that refer to both eating disorders and children.

OR: Widens a search because each hit will contain either term. The Boolean operator "OR" expands a search by requiring that either search terms before and after OR must appear in the article for the article to be retrieved by the search process e.g. type **epinephrine OR adrenaline** to find results that refer to epinephrine or adrenaline. This operator is used when a term can be described in more than one way (a synonym) and will also find results that contain both terms. It may also be used to find variants on words that are hyphenated e.g. **x-ray OR xray**

NOT: Narrows a search by excluding records containing specified words. The Boolean operator "NOT" also limits a search by requiring that the search term after NOT must not appear in the article when retrieved by the search process e.g. **bulimia NOT anorexia, hypertension NOT obesity**

Check your "sentence", make sure it says what you mean, e.g.

mountain AND (bike or bicycle)
common cold AND (vitamin c OR zinc)
(myocardial infarction OR heart attack) AND (prevention NOT aspirin)

Thesaurus Search

If a database includes a thesaurus, you are advised to make use of it. Running a search on a database's own thesaurus can help in the selection of terms that have been indexed in that database. It also serves to suggest related, broader and narrower terms as well as indicating preferred terms. Terms may have a scope (or explanatory) note giving details of their meaning in the context of the database. As an example Medline/PubMED has a medical subject headings MESH thesaurus included.

Other ways to focus (limit) your search:

Sometimes the problem in conducting a search is not that you will find too few articles, which is sometimes the case, but limiting the amount you do retrieve to make them more relevant. Another way of looking at this is that in addition to defining what is required from a search, it is equally important to define what is not required and how the search may be limited. A good well-focused search should retrieve manageable amounts of articles. I would suggest a figure of 30 -50 articles to be ideal. Remember, that from this amount only a few articles may be relevant to your needs. However from these articles by consulting the list of references or bibliography you may source other articles relevant to your search topic, a process known as hand-searching.

A useful limiter is date, all databases will allow you to focus your searches within specified date ranges e.g. articles from the last two or three years. This feature enables you to limit your searches to within the most up-to-date articles and as a result the most up-to-date information available. Other methods for limiting searches include limiting the search to one or more specific fields, such as title or abstract, to eliminate items where the search term(s) occur only in the full text, often just mentioned in passing.