Effective Search Techniques

Introduction
It is very easy to find information in an electronic database by typing in keywords. What is not so easy is to find the BEST information. This guide is intended to help you to find the best information quickly.

Search techniques are similar for all electronic resources, whether you are using an internet search engine, like Google; a bibliographic database like Web of Science; or an electronic reference book. However, bibliographic databases often offer additional search features.

Bibliographic databases contain references to documents, mainly journal articles, plus a short summary (an abstract) of the document. They are often referred to in this handout because of their importance in finding published information. Examples of bibliographic databases can be found in the subject guides: http://libguides.bham.ac.uk/subjectsupport/index

Starting your search
Very few databases allow you to do a natural language search, such as “is there a link between violence in the media and crime?” You need to pick out the keywords in your topic, and then link them with operators, such as AND or OR.

Keywords
The keywords in the above topic are violence, media and crime. You then need to think of synonyms, that is words with the same meaning. In this case:

Violence  media  crime
bloodthirsty  television  criminal
cruelty  film  offender
aggression  offence

Remember to include alternative spellings, such as American spellings (color as well as colour), acronyms such as TV for television, as well as alternative words, such as automobile as well as car.

As you search you may come across new keywords particularly in the keyword field (sometimes called index term field) in bibliographic databases.

Boolean Operators
These are the AND, OR and NOT operators, the logical operators from set theory.

AND is used to join search terms when you want both terms to be present in a record, so it is used to combine the different concepts in your search. In set terms this can be illustrated as follows:
Fig 1 **media AND crime**

The grey area represents the articles you want, with both the word **media** and the word **crime** in them.

**OR** is used to combine synonyms, i.e. words with the same or similar meanings. It will find articles containing **either or both** words.

Fig. 2 **media OR television**

Thus this search finds articles with the word **media**, or with the word **television**, or with **both** words (in the intersection in the middle).

**NOT** is used to eliminate concepts from your search. The term following NOT must be absent from the field in order for the record to be selected.

Fig. 3 **CFCs NOT HCFCs**

Therefore, this search will retrieve all documents with the term CFCs, but will eliminate any which also have the term HCFCs.

NB: use NOT with caution as you may eliminate articles which would otherwise have been useful to you. For example, the above search would eliminate an article comparing the effects of CFCs and HCFCs which may have contained some useful information about CFCs.

**Other search operators**

Different databases will offer different search operators, which may include the following:

**SAME** or **SENT**. The terms joined by SAME or SENT must occur in the same sentence for the record to be selected.

**NEAR, WITHIN** or **ADJACENCY** find words within a specified number of words of each other, helping you to pick up turns of phrase. Some databases allow you to specify whether your words should appear in a specific order, e.g. ‘behaviour’ before ‘therapy’.
It is important to consult the help screens of the database you are using to ascertain which search operators are available, and how they work.

**Phrase searching**
A phrase search is where the system looks for two words adjacent to each other and in that order, e.g. *toxic waste* will not find "waste which is toxic". To find a record with this sentence in would require AND, i.e. *toxic AND waste*.

Some databases will automatically do a phrase search if you enter two words together, some will automatically insert AND (e.g. Web of Science), or even OR. It is important to use the help screens of the database you are using to find out what it does. If the default is AND, you can often force a phrase search by using quotes, e.g. "toxic waste"; this forces the database to do a string search.

**Truncation**
Many databases have what is called a truncation symbol. This allows your search to pick up the different endings of words. In the Web of Science, OVID databases (e.g. Medline, PsycINFO) and the engineering Village database, (e.g. Ei Compendex), the symbol used for truncation is an * (asterisk). So a search for *manag* will find manager, manage, managing, and management.

Some databases also offer left-hand truncation, e.g. *therapy will find physiotherapy, psychotherapy etc, and *phosphate will find monophosphate, triphosphate etc.

**NB** Not all databases use the asterisk (*) as the truncation symbol. Find out the truncation symbol for the database (including search engines) you are using by checking the help screens.

**Wildcards**
A wildcard is a symbol which can be used to stand for any character. If ? is the wildcard, then a search for wom?n will find both woman and women. Not all databases support this feature, and the wildcard symbol is not always the ?. Use the help facility of the database you are using to find out if this feature is supported, and what symbol is used.

**Brackets**
Brackets are used to tell the system which order to process the operators in. The search

**gravel AND road OR highway**

Could be processed as **gravel AND road** to give a set of articles with both keywords, and it could then be OR’d with **highway**, which would combine this set with all the articles with the word **highway** in them, (not just those with **gravel** and the word **road**).

However the search:

**gravel AND (road OR highway)**

would OR the words **road** and **highway** producing a set of articles containing either one or the other word, and will then AND the result with the keyword **gravel** to produce a set of results with either **road** or **highway** and the word **gravel**. The brackets behave in the same way as they do in mathematical formulae, telling the system to process the operation within them first.

**Using controlled vocabulary**
Searching by controlled vocabulary is one way of efficiently pinpointing the articles you need. This is because each article added to the database is allocated descriptors from a controlled vocabulary. The controlled vocabulary standardises the way articles are indexed.
Many bibliographic databases will allow you to search using controlled vocabulary, either by browsing an index, searching a thesaurus, or your search terms will automatically be mapped against the controlled vocabulary.

Most thesauri are hierarchical in structure. When browsing the thesaurus, you will find that for each term there will be one or more of the following, Broader terms, Narrower terms, Related terms. For example, in the Compendex database, the term plastics has the following:

**Broader term:** materials

**Narrower terms:** conductive plastics, foamed plastics, plastic coatings, plastic filaments, plastic films, etc

**Related terms:** adhesives, latexes, petrochemicals, plastic products, polymers, resins etc

When you have viewed the controlled vocabulary you can select which terms you wish to search by, and combine them using the search operators mentioned in this handout.

**Narrowing a search**

If you get too many results you need to narrow your search:

- Use more specific keywords, e.g. a particular type of crime
- Restrict the fields searched, e.g. title field only.
- Restrict by language, e.g. English only.
- Restrict by publication date
- Restrict by document type (bibliographic databases) e.g. journal articles only, patents, or reviews. It is a very good idea to look for review articles, as they are a good introduction to a subject, bringing together everything that is known at a particular point in time; they also have long reference lists. If the bibliographic database you are using does not allow you to limit to reviews, you can use review as a keyword in your search.

**Broadening a search**

If you get too few results you need to broaden your search:

- Use broader keywords e.g. structure instead of building
- Include additional keywords using OR, e.g. violence OR aggression
- Separate out phrases, e.g. toxic AND waste instead of toxic waste. This looks for the two words anywhere in the record, not adjacent to each other, so finds more hits, though they may be less relevant.

**Help**

All databases have help screens. Many will have detailed documentation which you can print out. This may be found under help, under training, or under ‘about’ or perhaps as a ‘database guide’. Library Services provide many of our own guides at: [http://libguides.bham.ac.uk/subjectsupport/a-z](http://libguides.bham.ac.uk/subjectsupport/a-z)

If you are still unsure please contact the Information Desk on the ground floor of the Main Library, or contact the Academic Skills Advisors via the relevant subject page: [http://libguides.bham.ac.uk/subjectsupport/index](http://libguides.bham.ac.uk/subjectsupport/index)

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