Welcome to the Mundt Library at Dakota State University. We are here to help you with all of your information needs whether it be research for a class or personal interest in a topic. If you have any questions, feel free to ask a librarian.

In this video you will learn some techniques that will increase the effectiveness of your searches using electronic databases. The learning objectives that will be addressed include: an understanding that there are several techniques which when applied to a search produce more clearly defined and detailed results, being able to properly use quotation marks when searching for a phrase, understanding how Boolean operators affect the results of a search, being able to properly use wildcards to truncate keywords when searching, and understanding how nesting affects the results returned in a search.

To illustrate how the search techniques we will discuss affect research, we will work on a sample research project throughout the video. Say you are taking a class in biology and are given the following assignment: write a 4-5 page essay discussing the impact of global warming on a specific ecosystem. You must have at least 5 citations. Only 2 can be from the internet. You decide to start your search in Google by searching for global warming. What would you type into the search box?

**Using Quotation Marks**

By putting the term in quotation marks, you are telling the computer that the results must have the words global and warming right next to each other as a phrase. To see how quotation marks can affect your search, go to Google and perform a search for global warming. Look at the number of results. Then try the search again putting global warming in quotation marks.

The search using quotation marks brought back fewer results. It cut out those pages that contained the keywords global and warming and focused on those with global warming as a phrase. Quotation marks are a powerful way to limit and focus your search when you are searching for a phrase. Your search for global warming brought back too many results to be useful for your paper, so you will need to focus your results more.

**Using Boolean Operators**

To do so, we will use Boolean operators. While you may not know them by that name, you do know the Boolean operators. They are AND, OR, and NOT. These three words are some of the most powerful and useful techniques you can use to construct a successful search. In order to illustrate how Boolean operators affect your searches, will use Venn diagrams.

Consider this page as all of the sources in a database, either the internet or one of the library’s databases. You have decided to focus your research on how global warming affects polar bears. The circle on the left contains all the resources that discuss global warming. The circle on the right contains all of the resources that discuss polar bears. The overlapping section in the middle are sources that
discuss both global warming and polar bears. Which diagram illustrates the results of the search global warming AND polar bears?

AND is one of the most commonly used Boolean operators. It is used when combining two or more topics to decrease the number of results.

We will now look at what OR will do to a search. While you were looking through your results, you saw that several sites used the term climate change as well as global warming. You may be missing some good sources that only use the term climate change, so in order to get the sources that contain either phrase you should use the Boolean operator OR. Which Venn diagram illustrates global warming OR climate change?

OR will increase the number of search results and is often used when you are searching for a concept that has multiple terms that describe it. For example, women OR female or college OR university.

NOT is the last Boolean operator and is useful when you are searching for a term that has multiple meanings. For example you may be looking for information on the bird cardinal, but you continue to get results related to the baseball team in St. Louis. In order to limit your search you would use the phrase, cardinals NOT baseball.

Boolean operators are a great way to combine terms in order to focus, expand, and limit your search results. We will now look at the next search technique, truncation. When we searched for polar bears we may have missed out on sources that discussed the singular polar bear. It would be possible to run a search for polar bear as well as polar bears, but an easier way would be to truncate the search using a wildcard. Wildcard characters could be *, !, ?, or #, but many databases use the *.

**Using Truncation**

In order to search for both polar bear and polar bears, you would enter polar bear*. The wildcard character tells the computer to look for any term that starts with the characters polar bear. To truncate a group of words, take the root letters that are the same in each and then add the wildcard. What term would you use to find information on these keywords dealing with pollution: pollution, pollutant, pollute, polluted, polluting, and polluter?

Truncation is useful in several ways. When you have a singular and plural search for example child and children or when you have a verb with multiple endings for instance grow and growing and growth. You need to be aware when you create a truncated term that you do not make it too broad. For instance, in your search for glaciers and glacier, you use the term gla*. This will return results on glaciers, but it will also return results on gladiators, glamour rock, glands, and so on.

The final search technique we will discuss allows you to combine all of the techniques covered so far. Nesting is the use of parenthesis to separate parts of your search phrase, thereby letting the computer know the order by which it is to conduct the search. For example you want information on pest and weed control for tomatoes. You could perform two searches tomato AND pest and tomato AND weed. By nesting, however, you can combine these searches into one. You need the term tomato and you also
want the term pest or the term weed. By combining the terms, your search query will look like this tomato AND (pest OR weed). The computer will first find all sources with the term pest or weed. Then it will limit those results to the items that also contain tomato. If you did not use the parenthesis, a search for tomato AND pest OR weed may have brought back the results you wanted or it may have brought back the terms tomato and pest plus those that had weed without tomato. It is important to tell the database exactly how to perform your search. They each have a standard format on how they will react to the search terms. By using these search techniques, you are making sure the computer searches as you want it to.

Different databases and search engines react to the search techniques differently, so you should consult the search tips or help screen to discover that techniques you can use in each.

**Using Nesting**

Using all of the search techniques discussed in this video, what would you do to search for information on how global warming is affecting polar bears? (global warming OR climate change) AND polar bears, (“global warming” OR “climate change”) AND “polar bear*”, or (“global warming” AND “climate change”) AND “polar bear*”.

To fully gain an understanding and appreciation for these search techniques, you must use them during your research. The next time you are searching for a phrase, try putting it in quotation marks and see the difference in your results. Through practice you will gain skill in creating search queries that let the computer know exactly what you want. If you would like assistance creating a search query, feel free to ask a librarian.

In this video, you learned about several search techniques that can aid you when using electronic databases including: quotation marks, Boolean operators, truncation, and nesting.

**Answers to Quiz Questions**

- **What would you type into Google to find information on global warming?**
  1. global warming
  2. “global warming”
  3. (global warming)
     - “global warming” By putting the term in quotation marks, you are telling the computer you want your results to have the words global and warming right next to each other as a phrase.

- **What diagram illustrates the results from a search global warming AND polar bears?**
  1. A

- **Which diagram illustrates the results for the search global warming OR climate change?**
  1. C

- **What would you use as a search query to find information on pollution, pollutant, pollute, polluted, polluting, and polluter? Use an * as your wildcard character.**
1. pollut*

- How would you search for information on how global warming is effecting polar bears?
  1. (global warming OR climate change) AND polar bears
  2. (“global warming” OR “climate change”) AND “polar bear*”
  3. (“global warming” AND “climate change”) AND “polar bear***”