This guide describes:
- When to use Google and when to use a specialized library resource
- Google and its many search techniques
- Strategies to improve the effectiveness and efficiency of Google searching
- “Hedges” or suggested terms to use for common search topics in health, genomics, or nursing
- Google Scholar and how to obtain full text articles from Google Scholar
- Where to learn more about Google

Google (http://www.google.com/) is a popular search tool because even novice searchers can find relevant information. Expert searching requires subject or discipline content knowledge, understanding of scholarly communication patterns of the discipline, awareness of information databases important to the field, and the structure, vocabulary, and search operators used by each database. Expert searchers carry the search further by understanding how to also access full text. Applying expert searching to Google is easy when you know the following:

**To Google or Not to Google?**
Do you use Google to search for everything? Are you satisficed*, rather than satisfied, with the answers you find? Google is convenient and easy to search. However, it's not always the best or quickest source for the information you're seeking.

Don't start at Google if you need specialized information. When deciding where to begin your search, consider the following criteria:

<table>
<thead>
<tr>
<th>Use a web search engine when you:</th>
<th>Use a specialized library resource when you:</th>
</tr>
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<tbody>
<tr>
<td>Have forgotten the URL for a website</td>
<td>Need high quality information</td>
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<tr>
<td>Need a quick fact or two</td>
<td>Need evidence based information</td>
</tr>
<tr>
<td>Are more concerned with speed of retrieval, than with the accuracy of information</td>
<td>Need to be assured of the accuracy of information</td>
</tr>
<tr>
<td>Need a webpage, but not other types of documents</td>
<td>Need documents not available via Google (Print books or journals)</td>
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<tr>
<td>Need a resource that is from the ‘grey literature’ (reports, white papers, meeting abstracts)</td>
<td>Need specialized information</td>
</tr>
<tr>
<td>Need multimedia resources</td>
<td>Need user support (librarians, classes, tutorials, handouts)</td>
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</table>

*Satisficed - a conjunction of satisfied and suffice; You are satisficed when you decide on and pursue a course of action satisfying the minimum requirements to achieve a goal. The term was coined by H. Simon in *Psychol. Rev.* 69 : 129 1956

**What Is The Scope Of Google?**
Google contains millions of documents in many formats besides web pages without discrimination of the quality of the documents, and is searching an indexed file of documents, not the World Wide Web. Google does not include many "invisible web" documents, i.e., those that are embedded within other web based databases, although Google is forming partnerships and creating tools to include these hidden documents. Google indexes not only the content of a page, but also html coding and metadata that is "behind the scenes".

**How Does Google Rank Results?**
Google weights word location (in the title or header) and page popularity (how many pages link to a page in your results list). Also important are word frequency, word order, and word proximity.

**What Limits Does Google Use?**

In the Advanced search form, Google allows limits to a page title or url (inurl:library or intitle:hiv), file format (filetype:pdf), site or domain (site:cdc.gov or site:gov). You can also limit to pages that are similar to a web page or that link to a particular page.

**How Many Characters Can Be Searched In One Query?**

There is a limit of 32 words.

**Does Google Use Stop Words?**

There is a list of common words Google won’t search. To over-ride the stop list use + or phrase quotes (about Google or "black and white")

**How Does Google Handle Punctuation?**

Apostrophe can be used and will retrieve different results (crohns OR crohn's)

**What Operators Does Google Use?**

- Google uses *Boolean Operators*. The default operator is **AND**. **OR** (all caps) or the "pipe" symbol ( | - usually found above the enter key ) can also be used. Google will process the terms connected by **OR** first, then **AND** with other terms in the query. **NOT** isn't available in Google, use the minus sign before a term to eliminate unwanted terms (Abraham Lincoln -school)
- Google uses *stemming* rather than a truncation (or wildcard) symbol. An asterix (*) can be used to replace a word or words in a phrase ("occupational **health" retrieves occupational health and occupational safety and health as a phrase)
- *Synonymous or related terms* can be retrieved by using the tilde (~). The ~ should be used with caution as additional terms may be too broad to be useful in searching (~nutrition retrieves health or food).
- *Phrases* can be searched by putting quotes (" "+) around terms. Use a hyphen in a phrase that can be one word or two (health-care)
- *Include terms* in the pages retrieved by preceding terms or phrases by a plus sign (+).
- *Specify a number range* using two periods between numbers or dates (seven years war 1500..2000)

**Strategies To Improve The Quality And Efficiency Of Google Searching**

- Use the "Big Bite" strategy. Start with a fairly broad query, then narrow results by adding more terms as needed:
  ~teen ~pregnancy
  ~teen ~pregnancy ~prevent
  ~teen ~pregnancy ~prevent ~internet OR ~online
- Try using more specific terms rather than fewer general terms in a search
  USE ~marijuana ~coca~ine ~heroin ~PCP ~methamphetamine INSTEAD OF drug abuse
- Click the Similar Pages link to retrieve other similar websites
- Useful Hedges (add your term or terms to these queries)
  o **Biography:** ~biography | ~profile | ~cv
  o **Conferences:** ~conference | ~meeting | ~congress | ~symposium | ~proceedings
  o **Genetics/Genomics:** ~genetics | ~genomics | ~proteomics
  o **Geriatrics:** ~geriatric | ~elderly
  o **Health/Medicine:** ~medicine | ~health | ~hospital | ~disease
- Consider using a specialized Google search, such as: Scholar, News, Books, Blog Search, Groups. (See the handout More Google at [http://hsl2.ucdenver.edu/handouts/class-handouts/google.pdf](http://hsl2.ucdenver.edu/handouts/class-handouts/google.pdf))

Google Scholar ([http://scholar.google.com/](http://scholar.google.com/)) provides a simple way to broadly search for multidisciplinary scholarly topics and retrieve peer-reviewed papers, theses, books, abstracts and articles, from academic publishers, professional societies, preprint repositories, universities and other scholarly organizations.

Google Scholar should not be your only research/citation resource. To be more comprehensive, search for additional articles in MEDLINE (PubMed or Ovid) and additional citations in ISI Web of Science. ([Handouts on these resources available at [http://hslibrary.ucdenver.edu/handouts](http://hslibrary.ucdenver.edu/handouts)](http://hslibrary.ucdenver.edu/handouts))

**How Does Google Scholar Work?**

- It uses Google technology to search full text journal articles
- Publishers allow Google to crawl their sites, which is why Google Scholar covers different journals and proceedings than found in ISI Web of Science
- Full text searching and large scope of Google Scholar are the primary benefits
- Cited references included, can click to see citing articles.
- Citation frequency is factored into the ranking algorithm
- Access to full text articles is available only by subscription or pay-per-view, unless the publication is Open Access, available via UC Denver’s full text article collection

**Does Google Scholar Link to UC Denver’s HSL’s Full Text Journals?**

Users can set Google Scholar preferences that link to the Library’s full text journals. To set preferences in Google Scholar, click on the gear symbol in the upper right, then click Library Links, type colorado anschutz into the Library Links query box, select up to three libraries, and click on Save Preferences.

**Can I Capture References to EndNote/Reference Manager/BibTeX?**

Google Account users can set Google Scholar preferences that create a link for capturing citations to Bibliographic software. To set this preference, log in and click on Scholar Preferences, scroll down to Bibliographic Manager, click next to Show links to import citations into and select your preferred program in the menu. Click on Save Preferences.

Once you have set your preferences, look for a link under each citation that says “Import into EndNote” (or whatever software you chose). The quality and completeness of the captured reference will depend on the data Google can capture from the reference. If a reference is not complete, you can add more details manually, or delete the reference and capture the data from another source – PubMed, Web of Science, Library of Congress or National Library of Medicine. Follow the instructions for capturing references in your software’s help files.

**Finding Specific Resources in Google Scholar**

- Use as many elements as you know: author last name, important title words or phrases, date, volume, or page number.
- Eliminate elements until you retrieve the relevant citation.

  **FOR EXAMPLE:** stuart harris influenza 1939 (retrieves: Stuart-Harris CH. A neurotropic strain of human influenza virus. Lancet 1939; 236:497-499.)

**Where to learn more about Google and Google Scholar**

The About Google link and help pages are useful, but Google doesn't always share complete information about proprietary search techniques. The Google Guide ([http://www.googleguide.com](http://www.googleguide.com)) provides additional insight into Google’s search capabilities.