The Planning Stage: A Research Strategy

CHEM 23201
Fall 2018

1. Pick up the handouts
2. Hand-in assignment #1
3. Download in-class activity from course page

Quote

• “Many [people] skip over the planning stage of a search and are poor at selecting the right sources and search terms.”
  - Angela Newton, 2005 Spring meeting of USTLG.

Podcasts & Articles

• Due next week
  • Be prepared to discuss

Overview

• Call Numbers
• Publication Types
• Planning Stage
  • Research Strategy
  • Practice

CALL NUMBERS

Library of Congress
Call Number Classification

• Q - Science
  • QA – Mathematics
    • QA76 Computer Science
  • QB – Astronomy
  • QC – Physics
  • QD – Chemistry
    • QD146 - 197 Inorganic
    • QD241 - 441 Organic
  • QH – Biology
  • GP – Physiology
• R - Medicine
  • RS – Pharmacy
• S - Agriculture
• T - Engineering
  • TA – Civil
  • TJ – Mechanical
  • TK – Electrical
• TN – Mining
• TP – Chemical
Reading a Call Number

  - By Bernhard Schrader
  - QD 272
  - Subject: Organic Chemistry - organic analysis - special methods - spectrum analysis
  - S6
  - Author: Schrader
  - 1989
  - Year published

- **Dictionary of Inorganic Chemistry**
  - J.E. Maenpaa, Editor
  - QD 148
  - Subject: Inorganic Chemistry - Dictionaries and encyclopedias
  - D53
  - Title: Dictionary...
  - 1992
  - Year published

Publications Types

- Abstracts
- Almanacs
- Books
- Dictionaries
- Dissertations
- Encyclopedias
- Guides to the Literature
- Handbooks
- Indices
- Journals
- Newspapers
- Patents
- Preprints
- Proceedings
- Technical Reports
- Theses

Classifying Publication Types

- **Original Research**
- **Primary**
  - Reporting original research
- **Secondary**
  - Organizing & summarizing primary literature
- **Tertiary**
  - Guides to the literature

Publication Type Timeline

**Key:**
- Original Research
- Primary
- Secondary
- Tertiary

<table>
<thead>
<tr>
<th>Day of Event</th>
<th>Preprints</th>
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<td>Months after</td>
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<td>Years after</td>
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PLANNING STAGE

**A Research Strategy**

For 21st Century Tools
Research strategy in six steps

1) **Summarize** your topic
2) **Identify** key concepts
3) **Related** terms and synonyms
4) **Build** a search
5) **Run** your search
6) **Examine** results & **Refine** your research strategy

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1. **Summarize** your Topic

- Clearly & concisely state your topic
- Put it in the form of a question
- Add comments
  - I don’t want to include...
  - I need to include research from...

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2. **Identify** Key Concepts

- Identify a minimum of two concepts
- Concrete & unambiguous as possible
- Prioritize them
- They are usually nouns, sometimes verbs
- They can be a single word or a phrase

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3. **Related** terms & synonyms

- Think of different ways someone might express each concept:
  - Synonyms
  - Alternative spellings
  - Variant endings
  - Variant beginnings
  - Acronyms
  - Narrower terms
  - Broader terms
- Use encyclopedias, dictionaries, handbooks

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4. **Build** a Search

- How do I most effectively talk to the database?
- What should you know about each database?

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4.3 - **Boolean Operators**

- **AND** (must have all search terms)
  - Ex: inhibitor AND enzyme
- **OR** (must have at least one of the search terms)
  - Ex: corn OR maize
- **NOT** (excludes a search term)
  - Ex: integration NOT school
Boolean Operator - AND

Aspirin ∩ Blood

Ex – aspirin AND blood

Boolean Operator - OR

Ham ∪ Pork

Ex – (ham OR pork)

Boolean Operator - NOT

Integration ∩ School

Ex – integration NOT school

4.4 - Truncation

• Single letter (0 or 1 letter)
  • Chemical?
    • Chemical, Chemicals
  • Multiple letters (0, 1, or more letters)
    • Chem*
      • Chemic, Chemical, Chemistry, Chemists, etc.
  • Left
    • $organic
      • Bioorganic, Inorganic, Bioinorganic, etc.

4.4 – Art of Truncation

Goal: Get EVERYTHING you want and NOTHING you don’t want

• Key concept: catalyst
• Don’t truncate
• Catalyst* =
• Catalys* =
• Cataly* =
• Catal* =
• Cata* =

4.4 – Art of Truncation

Goal: Get EVERYTHING you want and NOTHING you don’t want

• Key concept: catalyst
• Don’t truncate
• Catalyst* = catalyst, catalysts
• Catalys* = catalysis, catalyse, + previous line
• Catalytic* = catalytic, catalyzes, catalysotype, etc. + previous line
• Catal* = catalogue, catalase, catalan, Catalonia, catalog, cataluminescence, Catalina, catalepsy, etc. + previous line
• Cata* = catastrophe, cataclysmic, catacomb, etc. + previous line
4.5 - Wildcards

• Single letter
  • Wom?n
    • Woman, women

• Multiple letters
  • Phosphor??s
    • Phosphors, phosphores, phosphorous, phosphorus
  • Lab*r
    • Labour, labor, labrador, labeler, etc.

4.6 - Phrases

• “Fighting Irish”
  • WVFI Radio: The Voice of the Fighting Irish
  • Born Fighting: How the Scots-Irish Shaped America
  • Irish man fighting for life after fall from scaffolding in Australia

4.6 - Phrases

• “Fighting Irish”
  • Retrieves this
    • WVFI Radio: The Voice of the Fighting Irish
  • But not this
    • Born Fighting: How the Scots-Irish Shaped America
  • Nor this
    • Irish man fighting for life after fall from scaffolding in Australia

4.7 – Grouping words

• ()
  • (group words or phrases from the same concept)
  • Ex (corn OR maize OR cereal OR cbh351) AND (lunch OR dinner OR “mid-day meal”)

Order of Operators - Math

• $3 + 7 \times 4 - 2 = \\
  • ((3 + 7) \times 4) - 2 = 38$
  • $3 + (7 \times 4) - 2 = 29$
  • $(3 + 7) \times (4 - 2) = 20$
  • $3 + (7 \times (4 - 2)) = 17$
Order of Operators - Databases
Pig NOT swine OR poultry AND antibiotics

Order of Operators - Databases
(Pig NOT) swine OR poultry AND antibiotics

5. Run your search

6. Examine results & Refine your research strategy
• Review initial search results
• Did you get the results you expected?
  • Either modify step 4 or reevaluate steps 1-3
  • Then repeat step 5
• Are there new synonyms or related terms
  • Add those to your list in step 3
  • Repeat step 5 with new information added

Search Tip
25/250 Guideline
• Results under 25
  • Subtract a concept
  • Use synonyms or broader terms
  • System may consider your terms as a phrase
    • Use AND between concepts
• Results over 250
  • Add another concept
  • Use narrower terms
  • Search terms as a phrase
  • Limit by Review Articles

Do the preceding steps
Otherwise you will need the following
Handy Guide to Jargon

0. Integrated 1. Total 2. Systematized 3. Parallel

Handy Guide to Chemistry Jargon

0. <empty> 1. Covalent 2. Elemental 3. Electrolytic
4. Reduced / ing 5. Ionic / Ionized 6. Hydrogen

Practice

Getting Background Information

- chemistry.library.nd.edu
  - CHEM 23201 icon
    - Session 2
  - Links to 5 sources — Pick 3 of them
    - If one source doesn’t mention your compound then try the 4th or the 5th
  - Fill out the Research Strategy Worksheet for each source
    - Your compound is Concept 1