

Cleveland State University

From the Selected Works of Theresa M. Nawalaniec

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Engaging Non-Science Majors in the Chemistry Around Us Through Information Literacy

Theresa M. Nawalaniec, *Cleveland State University*

Reiko M. Simmons, *John Carroll University*



Available at: https://works.bepress.com/theresa_nawalaniec/12/

Engaging Non-Science Majors in the Chemistry Around Us through Information Literacy

Theresa M. Nawalaniec (presenter), Dr. Reiko M. Simmons

Cleveland State University



Photo Credit: CollegeDegrees360

Overwhelmed! Non-science majors often feel overwhelmed by the thought of taking a chemistry class and the process of learning chemical principles. Is there a way to make it less daunting for them?



Photo Credit: The Land Conservancy for Southern Chester County, <http://tlcforscc.org/>

Taking ownership... If a student is able to feel a sense of ownership in her/his learning process by participating in active learning exercises, including making some choices based on interest, then chemistry is not so intimidating or overwhelming. Student interest can be used as a bridge to learn Chemistry concepts.

Outline

- CHM 151 – Chemistry Around Us
 - > Text: Chemistry in Context: Applying Chemistry to Society (A Project of the American Chemical Society)
 - > Meets Science requirement as well as “writing across the curriculum”
 - > Dr. Reiko Simmons, instructor
- Group Project/Presentation Assignment
- Information Literacy Components
- Grading/Results

Group Project

◉ Topic Assignment

1. Choose one of the following topic areas corresponding to a book chapter:
 - > Global warming
 - > Energy
 - > Water/Acid Rain
 - > Drugs
 - > Genetics
2. Narrow topic
3. Instructor approval

◉ Planning

1. Divide and assign subtopics to members
2. Group meetings to check progress

Project Readiness Check-sheet

1. How many times did your group come together?
2. Do you have your individual contributions ready?
3. Do you know what your responsibility will be to prepare for the presentation?
4. Do you know what you are to do on the presentation day?
5. When will you be ready with #s 3 & 4?
6. Do you feel confident with your group's progress?
7. Do you feel confident with your own progress?
8. Do you have any suggestions/opinions regarding the progress toward the completion?

Journal Research

- Find and study at least 5 journal articles on the assigned subtopics
- Journals should meet the following criteria
 - > contain up-to date information on Chemistry
 - > accurate in terms of scientific information
 - > sufficiently detailed to give additional information beyond text
 - > contain information which will answer one or two major questions highly related to the subtopic
 - > include a reference which can be checked
- Write a short summary and commentary
 - > Attach references/bibliography

Presentation

- ◉ Organization

- > Group discussions
- > Integrate the usable information
- > Plan the entire presentation to last 5-10 minutes

- ◉ Presentation Method(s)

- > Choose a creative and imaginative method of presentation
- > Divide up the responsibilities for the presentation preparation
- > Prepare visuals and handouts to be delivered
- > Determine and request equipment
- > Be present and participate in the presentation

Information Literacy Session

- ◉ PowerPoint Presentation
- ◉ CHM151 Research Guide (LibGuide)
- ◉ Library Exercise

How to Read a Scientific Article

Mary Purugganan, Ph.D. maryp@rice.edu

Jan Hewitt, Ph.D. jhewitt@rice.edu

Cain Project in Engineering and Professional Communication

Reading a scientific article is a complex task. The *worst* way to approach this task is to treat it like the reading of a textbook—reading from title to literature cited, digesting every word along the way without any reflection or criticism. Rather, you should begin by skimming the article to identify its structure and features. As you read, look for the author's main points. Generate questions before, during, and after reading. Draw inferences based on your own experiences and knowledge. And to really improve understanding and recall, take notes as you read. This handout discusses each of these strategies in more detail.

1. Skim the article and identify its structure.

Most journals use a conventional IMRD structure: An abstract followed by Introduction, Methods, Results, and Discussion. Each of these sections normally contains easily recognized conventional features, and if you read with an anticipation of these features, you will read an article more quickly and comprehend more.

Features of Abstracts

Abstracts usually contain four kinds of information:

- purpose or rationale of study (why they did it)
- methodology (how they did it)
- results (what they found)
- conclusion (what it means)

Most scientists read the abstract first. Others—especially experts in the field—skip right from the title to the visuals because the visuals, in many cases, tell the reader what kinds of experiments were done and what results were obtained. You should probably begin reading a paper by reading the abstract carefully and noting the four kinds of information

How to Read a Scientific Paper¹

1. Read the abstract
2. Browse the article to see its structure
3. Make sure you understand the vocabulary – look up words if necessary
4. Generate questions as you read the paper looking for main points
5. Take notes as you read – use template
6. Reflection/Criticism – make inferences based on prior knowledge

Template for Taking Notes on Research Articles:²

Whenever you read an article, pertinent book chapter, or research on the web, use the following format (or something similar) to make an electronic record of your notes for later easy access. Put quotation marks around any exact wording you write down so that you can avoid accidental plagiarism when you later cite the article.

Complete citation. Author(s), Date of publication, Title (book or article). Journal, Volume #, Issue #, pages:

If web access: URL; date accessed:

Key Words:

General subject:

Specific subject:

Hypothesis:

Methodology:

Result(s):

Summary of Key Points:

Home - CHM 151 - Chemis... x +

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CHM 151 - Chemistry Around Us

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Last Updated: Jun 23, 2014 URL: <http://researchguides.csuohio.edu/chm151> [Print Guide](#)

Home

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Citations

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Video

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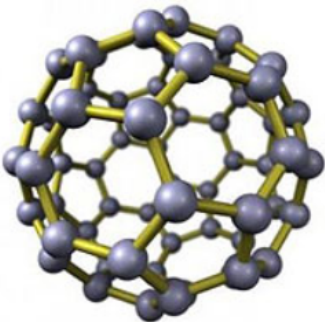
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Introduction

Welcome to the CHM 151 Research Guide! Here you will find resources to help you with your research paper. Just click on the above tabs to get started. If you have questions or want help, please contact me using my information in the column on the right.

[Comments \(0\)](#)

How and Why to Create a Library PIN

Your library PIN is needed to:


- access your CSU library account
- access research databases when off-campus
- renew your books online
- check the status of OhioLINK requests

To create a PIN:


- [Click here to set up a PIN](#)
- Enter your name and CSU ID number, **leaving the PIN field blank**
- Click submit and you will be prompted to enter a PIN

[Comments \(0\)](#)

Presentation Practice Room



Sciences and Engineering Librarian



Theresa M. Nawalaniec

[Schedule Appointment](#)

Contact Info

Michael Schwartz Library
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Library Exercise

1. Run a search in the Electronic Journal Center (EJC) on *acid rain* and *sulfur dioxide*. How many results do you obtain?

Run the same search again, but with acid rain in the title field. Now how many results do you get?

2. Does CSU subscribe to the journal titled Environmental Pollution? If so, is it in print or electronic format?
3. The following reference is in an ACS publication:
Environ. Sci. Technol. 2009, 43, 4824–4829

Access this article online. What is the title of “Figure 3” in this article?

4. In Web of Science, how many articles contain the term *toxic metals* in the title?

Evaluation

● Attendance/Participation/Quizzes	10%
● Homework	20%
● Chapter Tests	20%
● Group Discuss.Reports/Presentation	5%
● Project	25%
● <u>Final Examination</u>	<u>20%</u>
Total	100%

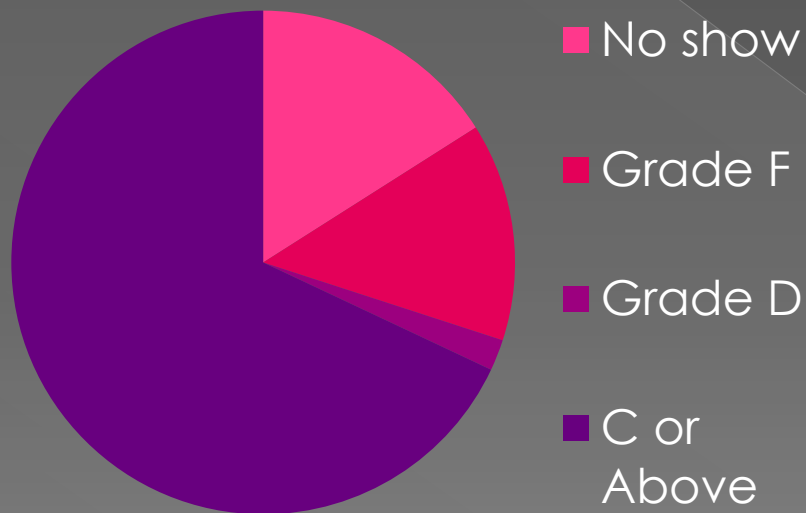
E V A L U A T I O N

Point Assignment for presentation (out of possible 100 points): _____
Assign points below & include brief comments.

- (1) (10 points)
Choice of presentation method (ex. skit, game, mini science fair, poster, powerpoint, etc.)
- (2) (20 points)
Preparation, organization & professionalism
- (3) (20 points)
Content of presentation & was it understandable & pertinent?
- (4) (15 points)
Visuals & handouts
- (5) (10 points)
Preparation of appropriate equipment (ex. procurement of projectors, etc)
- (6) (10 points)
Time (staying within the 5-10 minute time limitation)
- (7) (15 points)
Attendance (was student present for presentation, did student participate in presentation, etc)

Statistics (Before)

Before



No show = Did not attend at all
= 6 out of 37 = 16%

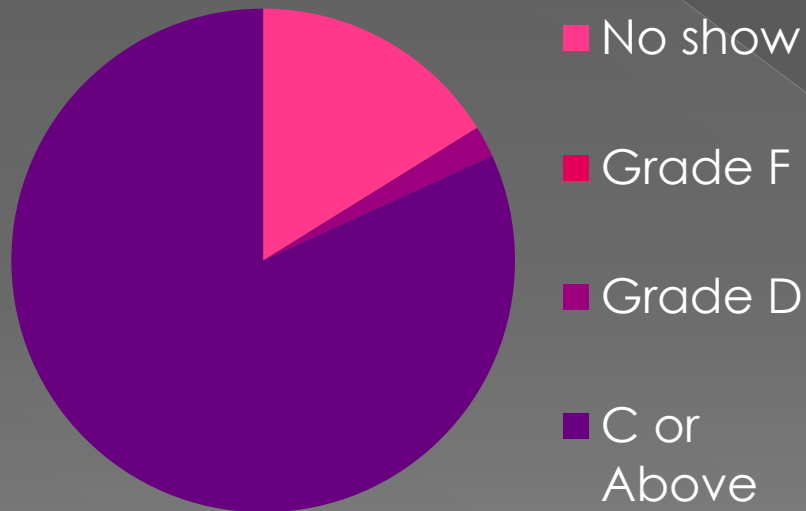
Grade of F = Total score of below 40
out of 100 points = 5 / 37
= 14%

Grade of D = Total score of above 40
out of 100 points = 1/37
= 2 %

Passing Grade (C – or above) = Total
score of 50 or above = 25/37
= 68 %

Statistics (After)

After



No show = Did not attend at all
= 6 out of 37 = 16%

Grade of F = Total score of below 40
out of 100 points = 0 / 37
= 0%

Grade of D = Total score of above 40
out of 100 points = 1/37
= 2 %

Passing Grade (C – or above) = Total
score of 50 or above = 30/37
= 81 %



Dr. Simmons' granddaughter

Success! Students do not fail the class and most get a grade of C- or better (a 13% increase).

References

- ¹Purugganan, M. and Hewitt, J. How to Read a Scientific Article.
http://www.owlnet.rice.edu/~cainproj/courses/sci_article.pdf (accessed August 26, 2009)
- ²Template for Taking Notes on Research Articles.
<http://www.owlnet.rice.edu/~cainproj/writingtips/notes2.pdf> (accessed August 26, 2009)