03 Analyzing Research Articles and Text

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **Oct-June**
Status: **Published**

General Overview, Course Description or Course Philosophy

Introduction to Science Research Methods CP is the first course in a three year sequence of courses. Students learn research methodology in the natural sciences by accessing scientific databases, using online bibliographic search techniques, learning how to analyze and create scientific presentations to be shared in class and during the end of year Symposium. There will be an emphasis for students to obtain a mentor by the end of school year to help further their research studies. Students will have the opportunity to apply basic research methods in the area of Molecular Biology and Bioinformatics.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Authors choose evidence to shape and support their arguments. Individuals evaluate the line of reasoning and evidence to determine to what extent they believe or accept an argument. Scientific journals are peer-reviewed and provide information that can be used to reproduce scientific work in the laboratory or in the field.

CONTENT AREA STANDARDS

LA.RI.9-10.2	Determine a central idea of a text and analyze how it is developed and refined by specific details; provide an objective summary of the text.
LA.RI.9-10.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).
LA.SL.9-10.1	Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with peers on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
LA.SL.9-10.4	Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.
VHEL.9-12.9.4.12.H.5	Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice.
VHEL.9-12.9.4.12.H.16	Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions.
VHEL.9-12.9.4.12.H.42	Conduct and participate in meetings to accomplish tasks.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

TECH.9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).
TECH.9.4.12.TL.4	Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem (e.g., 7.1.AL.IPERS.6).

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will know:

- How to employ reading strategies such as annotating text, highlighting, summarizing, and presenting verbally to gain a greater understanding of scientific writing.
- How to effectively discuss topics in class using various techniques to further understand the scientific text.
- That scientific evidence must be evaluated for credibility and validity by examining the primary source document.
- Topics may have multiple points of view and may produce conflicting studies that may need to be evaluated.
- A variety of strategies (e.g., brainstorming, concept mapping, prewriting, exploration of space, drafting) can be used to illustrate, organize, and connect ideas.
- Inquiry confirms or challenges one's existing understandings, assumptions, beliefs, and/or knowledge.
- Information used to address a problem may come from various secondary sources (e.g., articles, other studies, analyses, reports) and/ or primary sources (e.g., original texts and works, material culture, or personally collected data such as from experiments, surveys, questionnaires, interviews, observations, personal narratives).
- Online databases (e.g., EBSCO, ProQuest, JSTOR, Google Scholar) and libraries catalog and house secondary and some primary sources.
- Advanced search tools, Boolean logic, and key words allow scholars to refine, focus, and/or limit their searches based on a variety of factors (e.g., date, peer-review status, type of publication).

Procedural Knowledge

Students will:

- Employ appropriate reading strategies to scientific journals and scientific writing
- Summarize and explain the text aim while avoiding generalizations and oversimplification.
- Accessing and managing information using effective strategies.
- Retrieving, questioning, organizing, and using prior knowledge about a topic.
- Evaluating the relevance and credibility of evidence used.
- Evaluating the validity of a study based on data.

- Evaluating multiple perspectives about a topic of study.

EVIDENCE OF LEARNING

Formative Assessments

Scientific journal summaries

Scientific Journal - annotations

Journal Presentations

Group discussions

Summative Assessments

- Benchmarks – departmental benchmark given at the end of MP1, MP2, or MP3 & MP4 b(Semester Based Course)
    - Lab binders evaluation
    - Biweekly assessment
    - Lab notebook assessment
- Alternative Assessments
    - Lab inquiries and investigations
    - Lab Practicals
    - Exploratory activities based on phenomenon
    - Gallery walks of student work
    - Creative Extension Projects
    - Build a model of a proposed solution
    - Let students design their own flashcards to test each other
    - Keynote presentations made by students on a topic

- Portfolio

RESOURCES (Instructional, Supplemental, Intervention Materials)

http://www.albany.edu/uhs/src.php

http://www.albany.edu/scienceresearch/

http://static.nsta.org/files/PB297Xweb.pdf

www.Sciencebuddies.com

https://www.aaas.org/

INTERDISCIPLINARY CONNECTIONS

Statistics

Technical writing/reading skills

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.