

04 Presentation of Research Articles/Science Symposium/Science Competitions

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

General Overview, Course Description or Course Philosophy

Intermediate Science Research Methods Honors is the second 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 secure a mentor by this year to develop an authentic scientific research project. Students will have the opportunity to apply basic research methods in the area of Molecular Biology and Bioinformatics.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Students will understand that communication of scientific ideas must be conducted through written text, open discussion, and formal presentations. The collaborative nature of scientific investigations requires scientist to work with people within their area of study and outside of their area of study. Scientist must be able to convey their message in an accurate and concise manner. Scientist present their ideas in a variety of forums (group collaborative meeting, conferences, etc).

CONTENT AREA STANDARDS

LA.W.11-12.2	Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
LA.W.11-12.5	Develop and strengthen writing as needed by planning, revising, editing, rewriting, trying a new approach, or consulting a style manual (such as MLA or APA Style), focusing on addressing what is most significant for a specific purpose and audience.
LA.W.11-12.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
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.3	Analyze the effectiveness of the process and quality of collaborative environments.

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand that:

1. Scientist engage in compelling arguments based on evidence.
2. Scientific communication of ideas must be conducted in a clear and concise manner using written text and verbal presentation methods.
3. Scholarly work benefits from the collaboration with others and the scholarly critique by others.
4. Scholars respect other opinions and learn by viewing problems from other perspectives.

Procedural Knowledge

Students will be able to:

1. Communicate research study ideas and analysis of articles in a laboratory notebook and research portfolio binder (SUNY UHS requirement)
2. Adhere to established conventions of grammar, usage, style, and mechanics.
3. Communicate information through appropriate media using effective techniques of design.
4. Adapt an argument for context, purpose, and/or audience.
5. Engage an audience by employing effective techniques of delivery or performance.
6. Reflect on and revising their own writing, thinking, and creative processes.
7. Provide individual contributions to overall collaborative effort to accomplish a task or goal.
8. Present research articles for discussion to class peers and instructor for critique (SUNY UHS requirement)
9. Present research article analysis at annual symposium (SUNY UHS requirement)
10. Meet biweekly for teacher and self assessment of research progress and presentation quality based on rubric provided by SUNY UHS (SUNY UHS requirement).
11. Communicate authentic research topic idea to peers, instructor, and potential mentors through written text documents (summaries, lab notebooks, presentations, etc).
12. Contact and follow up with potential mentors via email and phone communication.
13. Develop the Symposium booklet and program with input from instructor (SUNY UHS requirement).
14. Attend and participate in the Science Symposium (SUNY UHS requirement).
15. Provide Symposium invitation list and promote symposium within the local community as a way to

increase awareness of scientific research endeavors in Kinnelon High School. (SUNY UHS recommendation)

16. Enter appropriate science research competitions (if applicable) according to the organizations guidelines and procedures for recognition of their research and scholarship money. **

** if students performed reserach over the summer of their sophomore - junior year, they may qualify for competitions.

EVIDENCE OF LEARNING

Formative Assessments

Research portfolio binder

Lab notebook

Self Assessment (SUNY UHS)

Biweekly teacher assessment (SUNY UHS)

Presentation of research article (discussion in class)

Mentor Communication Log

Compeition paperwork requirements (if applicable)

Summative Assessments

- Benchmarks – departmental benchmark given at the end of MP1, MP2, or MP3 & MP4 b(Semester Based Course)
- Biweekly teacher assessment (SUNY UHS)
- Presentation of research article (PowerPoint, Prezi, etc)
- Research Symposium booklet and related materials
- Compeition reserach paper and presentation (or other requirements, if applcable)
- 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

INTERDISCIPLINARY CONNECTIONS

Statistics

Preesntation skills

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.

