

04 Project/Paper Development and Presentation for Symposium/Competitions

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

General Overview, Course Description or Course Philosophy

Advanced Science Research Methods Honors is the third 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. Students must have an established research project and mentor during this year in order to participate in Advanced Science Research Methods Honors. Students will be expected to complete a scientific research abstract (proposal) for submission (competition), a research paper, poster and presentation based on an authentic 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 Scientist present their ideas in a variety of forums (group collaborative meeting, conferences, etc). Scientific competitions are a forum to encourage young scientist to explore new ideas in different ways.

ESSENTIAL QUESTIONS

What do I want to know, learn, or understand?

What questions have yet to be asked?

How does my research question shape how I go about trying to answer it?

How does my project goal shape the research or inquiry I engage in to achieve it?

What information/evidence do I need to answer my research question?

CONTENT AREA STANDARDS

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| 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.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
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. Develop an abstract based on an authentic scientific research problem.
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. Create a scientific paper based on the JSHS guidelines provided for submission to the Junior Science and Humanities Symposium.
9. Develop a presentation and scientific research poster based on an authentic scientific research problem.
10. Follow the regulations, guidelines, and due dates to enter multiple science research competitions when applicable.

EVIDENCE OF LEARNING

Formative Assessments

Research portfolio binder

Lab notebook

research paper abstract (first draft)

research paper (first draft)

Competition Paperwork/documentation

Summative Assessments

Benchmark Assessment per quarter:

Research portfolio binder

Lab notebook

Research abstract

Research Paper/Presentation

Research Poster (if student does not qualify-poster will be presented at the Science Symposium)

Alternative Assessment:

Competition papers/presentation and other requirements set by the competition

RESOURCES (Instructional, Supplemental, Intervention Materials)

INTERDISCIPLINARY CONNECTIONS

Statistics

Oral Presentation Skills

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.