



Sophomore Scientific Research Project Common Assessment

All tenth grade science students are required to participate in the research, preparation, and presentation of this project. Below are the guidelines for all the students to follow to complete the Sophomore Scientific Research Project.

Each Student is required to complete:

- A research paper
- A visual component
- An oral presentation

Project Rationale:

Science is defined as “to know,” in science we want students to learn how to uncover knowledge to understand processes, structures, and changes that affect our universe. It is only with knowledge that we can help to better the world we live in. Using basic science skills such as inquiry and investigation students will research an important topic in one area of science, Earth and Space Science.

Students will be required to choose a scientific topic from a Grade Span Expectation domain in Earth and Space Science, **ESS1** the continual change process of the earth and earth materials, or **ESS3** the origin and evolution of galaxies and the universe. Students will draw upon unifying themes and skills in science to complete this project: (1) Scientific Inquiry (2) Nature of Science (3) Systems & Energy (4) Models & Scale (5) Patterns of Change and (6) Form & Function.

The science common assessment is a required portfolio entry. The visual component will be photographed and placed with the entry.

Science Project Alignment to the North Providence High School Graduation Expectations

- 1.1 Acquiring and applying knowledge and skills within and across the curriculum.
- 1.2 Analyzing and evaluating information.
- 1.3 Applying Technology as a learning tool across all disciplines
- 2.1 Working cooperatively and / or independently.
- 2.2 Applying problem solving strategies.
- 2.3 Utilizing resources and time effectively.
- 2.4 Accessing, compiling, interpreting and presenting data and information.
- 3.3 Understanding and accepting the benefits and consequences of his/her behavior.
- 4.1 Reading widely and critically
- 4.2 Writing clearly, concisely and persuasively.
- 4.3 Speaking, listening and interpreting effectively.

Science Project Alignment National Standards

National Standards in Historical Thinking

- SS II - Historical Comprehension
- SS III - Historical Analysis and Interpretation
- SS IV - Historical Research Capabilities

National Standards in Arts

- A1 – Creation / Performance

National Standards in Technology

- T3- Research and Information Fluency
- T4- Critical Thinking Problem Solving and Decision Making

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Science Project Alignment to the Grade Span Expectations

Grade Span Expectations

R-10-3 Breadth of Vocabulary Knowledge

R-10-7 Analyzing Informational Text

R-10-8 Analyzing Informational Text

W-10-1 Writing Conventions

W-10-2 Response to Text

W-10-3 Response to Text

W-10-6 Informational Writing

W-10-7 Informational Writing

W-10-8 Informational Writing

W-10-9 Writing Conventions

OC-10-2 Making Oral Presentations

Topic A: The Earth

ESS1 – The Earth and earth materials as we know them today have developed over long periods of time, through continual change processes.

- ESS1 (INQ+POC) -1 Provided with geologic data (including movement of plates on a given locale, predict the likelihood for an earth event.
- ESS1 (NOS) -2 Trace the development of the theory of plate tectonics or provide supporting geologic/geographic evidence that supports the validity of the theory.
- ESS1 (SAE+POC) -3 Explain how the internal and external sources of heat fuel geologic processes.
- ESS1 (INQ+POC+MAS)-4 Relate how geologic time is determined using various dating methods.

Topic B: Galaxies

ESS3 - The origin and evolution of galaxies in the universe demonstrate fundamental principles of physical science across vast distances in time.

- ESS3 (NOS) -5 Explain how scientific theories about the structure of the universe have been advanced through the use of sophisticated technology.
- ESS3 (NOS) -6 Provides scientific evidence that supports or refutes the big bang theory of how the universe was formed.
- ESS3 (SAE) -7 Based on the nature of electromagnetic waves, explain the movement and location of objects in the universe or their composition.
- ESS3 (POC+SAE) -8 Explain the relationships between or among the energy produced from nuclear reactions, the origin of elements, and the life cycle of stars.

Sophomore Scientific Research Project Components

The topic chosen must meet one of the grade span expectations in Earth and Space Science. A list of potential topics will be provided by your teacher.

1. Research Paper

Each student is required to complete a 3-5 page research paper. This paper must be typed in MLA format. The works cited page is not considered a page of your research paper. A minimum of 4 sources must be included in your paper. No more than 2 of your sources can be a website.

Requirements in organizing the research portion of the paper:

- A **minimum of three** typed pages in MLA format.
- Proper parenthetical documentation throughout paper.
- A minimum of four sources. No more than two sources can be from a website (magazine websites do not count).
- Use of current and appropriate science terminology which relates to the thesis statement.

The Research portion of the paper must include:

- **Introduction:** Provides a general overview of the topic and an italicized thesis statement.
- **Body:** Analyze your research that is related to the topic. Provide evidence that supports your thesis statement.
- **Conclusion:** Reflect on the results of your research according to your initial thesis statement.

The works cited page must include:

- MLA format
- At least four sources (only 2 may be websites)
- **The following sources are considered unacceptable:** No online encyclopedias may be used (i.e. Wikipedia) No encyclopedias may be used.

2. Visual Component:

The student must prepare and create a visual aid to use in the oral presentation. A visual representation of the research may be presented in one of three ways: PowerPoint, a 36" X 48" three panel board, or a model. A well-constructed visual should reflect upon the students' topic and research. PowerPoint and a three panel board must be organized with a catchy title and descriptive captions.

3. Oral Presentation:

The student must prepare a three to six minute oral presentation on his/her topic. In the oral presentation the student should reflect on the paper, the process, the visual aid, and their learning stretch. Please see attached rubric for further oral presentation guidelines.

4. Deadlines:

Project Proposal	Tuesday, January 27 th , 2009
Works Cited Page	Tuesday, February 24 th , 2009
Research Paper	Tuesday, March 31 st , 2009
Visual Component & Oral Presentation	The week of April 6 th , 2009

NPHS Rubric for Portfolio Entry

Level of Performance	Expectations
Distinguished	<ul style="list-style-type: none"> ▪ Communication: Project demonstrates evidence of a high level of organization. All requirements of the assignment are met. Oral and/or written skills are highly proficient. ▪ Thinking and Reasoning: Project is comprehensive and demonstrates a high level of analysis, synthesis, and problem-solving. ▪ Application: Project demonstrates an application of theory and knowledge to practice as derived from readings and coursework. ▪ Coherence: The rationale is clear, strong, and relevant as to how the Graduation Expectations and GSE's relate to the project. ▪ Self-Reflection: Project specifically explains the knowledge, perspective, or skill that has been gained through this assignment.
Proficient	<ul style="list-style-type: none"> ▪ Communication: Project demonstrates evidence of organization. Most requirements of the assignment are met. A proficient command of oral and/or written language is demonstrated. Errors in language, structure and grammar are minimal. ▪ Thinking and Reasoning: Project demonstrates some level of analysis, synthesis, and problem-solving. ▪ Application: Project shows some application of theory and knowledge to practice as derived from readings and coursework. ▪ Coherence: The rationale is clear and relevant as to how the Graduation Expectations and GSE's relate to the project. ▪ Self-Reflection: Project explains with a fair amount of clarity the knowledge, perspective, or skill that has been gained through this assignment.
Emerging	<ul style="list-style-type: none"> ▪ Communication: Project demonstrates little organization. Few requirements of the assignment are met. Several errors in language, structure, and grammar. ▪ Thinking and Reasoning: Project demonstrates little evidence of analysis, synthesis, and problem-solving. ▪ Application: Project demonstrates little application of theory and knowledge to practice as derived from readings and coursework. ▪ Coherence: The rationale is limited as to how the Graduation Expectations and GSE's relate to the project. ▪ Self-Reflection: Project explains and partially describes the knowledge, perspective, or skill that has been gained through this assignment.
Unacceptable	<ul style="list-style-type: none"> ▪ Project demonstrates the above characteristics to a minor degree or not at all.

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Sophomore Science Research Project Research Rubric and Checklist

Student's Name: _____

	Exceptional (5)	Above Average (4)	Average (3)	Below Average (2)	Fail (0)
Thesis (topic)	Thesis is well-developed and clear throughout; strong focus / controlling idea	Thesis is effective and clear throughout; focus / controlling idea is maintained throughout	Thesis is evident; focus / controlling idea may not be maintained throughout	Thesis is attempted; focus / controlling idea is vague throughout	Thesis is unclear; focus /controlling idea is not maintained throughout
Supporting Evidence	Fully developed details, rich and insightful elaboration which supports purpose by documentation	Details are relevant and support purpose; details are sufficiently elaborated on by documentation	Details are relevant and mostly support purpose by documentation	Details are irrelevant and generally do not support purpose; ineffective or no use of documentation	Irrelevant detail with no connection to purpose; ineffective or no use of documentation
Body	Intentionally organized for dynamic effect; strong command of sentence structure; uses language to effectively enhance meaning	Intentionally organized for effect; good command of sentence structure; uses language to enhance meaning	Generally organized for effect; uses language adequately, may show little variety of sentence structure	Attempted organizes; lapses in effect; lacks sentence control which may detract from meaning	Little or no organization; rudimentary or deficient use of language which detracts from meaning
Conclusion	Generates a response that refutes or supports the thesis statements by making significant connections from the research	Generates a response that refutes or supports the thesis by making important connections from the research	Generates a response that refutes or supports the thesis by making connections from the research	Generates a response that refutes or supports the thesis by offering connections from the research	Generates a weak response that does not refute or support the thesis and offers minimal or no connections to the research
Writing Conventions	Excellent use of and consistent application of the rules of grammar, usage, and mechanics	Good use of and consistent application of grammar, usage, and mechanics	Limited use of, but may have some errors in application of grammar, usage, and mechanics	Major problems and errors in the application of grammar, usage, and mechanics that interfere with meaning	Poor use of and errors in application of grammar, usage, and mechanics that leads response to be totally incorrect
Format	Accurate use of MLA format and text structure appropriate to 4 sources (only 2 website sources), 3-5 pages in length, context and works cited	Minor problem in application of MLA format and text structure appropriate to sources, page length, context, and works cited.	Noticeable problems in application of MLA format and text structure appropriate to sources, page length, context and works cited	Major problems in application of MLA format and text structure appropriate to sources, page length, context, and works cited	No evidence to the application of MLA format and/ or text structure appropriate to sources, page length, context, and works cited
				TOTAL SCORE (OUT OF 30)	

Numeric Rubric Conversion

Distinguished	Proficient	Emerging	Unacceptable
30	25	21	17 & below
29	24	20	
28	23	19	
27	22	18	
26			

Level of Proficiency: _____ Date: _____

Student's Name: _____ Topic: _____

EVALUATION COMPONENTS	EXCEPTIONAL (4)	ABOVE AVERAGE (3)	AVERAGE (2)	BELOW AVERAGE (1)	FAIL (0)
CONTENT					
▪ Introduction stimulated interest					
▪ Ideas organized developed and supported					
▪ Information detailed and appropriate					
▪ Link between historical research to the project theme					
▪ Learning stretch identified					
▪ Graduation Expectations (2)					
▪ Closure					
DELIVERY					
▪ Grammar and vocabulary					
▪ Eye contact					
▪ Volume					
▪ Rate					
▪ Speaker is engaging					
▪ Integration of visual aid					
APPEARANCE					
▪ Appropriate attire					
TIMING					
▪ 4-6 MINUTES					
TEACHER'S QUESTIONS (not part of 3-5 minutes)					
▪ Answers showed depth and understanding		-----	-----	-----	
▪					
▪					

TOTAL: _____

Sophomore Science Research Project Visual Aid Rubric and Checklist (Topic A)

Student's Name: _____

	Exceptional (5)	Above Average (4)	Average (3)	Below Average (2)	Fail (0)
Demonstration of Topic	The topic was very well defined by the visual arts medium.	The topic was clearly defined by the visual arts medium.	The topic was defined by the visual arts medium.	The topic was not clearly defined by the visual arts medium.	The topic was not defined by the visual arts medium.
Concepts Presented	Students communicated ideas consistently at a high level of effectiveness in at least one visual arts medium; which signified an understanding of how the communication of their ideas relates to the medium.	Students communicated ideas regularly at a high level of effectiveness in at least one visual arts medium; which signified an understanding of how the communication of their ideas relates to the medium.	Students communicated ideas in at least one visual arts medium; which signified an understanding of how the communication of their ideas relates to the medium.	Students communicated irrelevant ideas using an inappropriate medium; which signified an ineffective understanding of ideas.	Students failed to communicate their ideas; failed to demonstrate an understanding.
Creativity	The visual demonstrated superior creative thought, constructed knowledge, and developed innovative products and processes using a medium.	The visual demonstrated creative thought, constructed knowledge, and developed innovative products and processes using a medium.	The visual demonstrated some creative thought, knowledge, and innovation.	The visual attempted creative thought, knowledge, and/or innovation.	The visual lacked creative thought, knowledge, and/or innovation.
Effort	The visual was well constructed and detailed which demonstrated a great deal of effort.	The visual was constructed with detail which demonstrated sufficient effort.	The visual was constructed with some detail which demonstrated moderate effort.	The visual was constructed with minimal detail which demonstrated little effort.	The visual lacked detail in construction and demonstrates no effort.
Skills	The visual synthesized excellent craftsmanship, skill, and consistency.	The visual synthesized craftsmanship, skill, and consistency.	The visual attempted to demonstrate some craftsmanship, skill, and consistency.	The visual demonstrated very little craftsmanship, skill, and consistency.	The visual lacked any attempt at craftsmanship, skill, and consistency.
Connection to The ESS1	The visual was greatly enhanced by the representation of the earth; its development and processes of change, left a lasting impression	The visual was enhanced by the representation of the earth; its development and processes of change, which left a lasting impression.	The visual represented the earth; its development and processes of change, but did not leave a lasting impression.	The visual barely represented the earth; its development and processes of change which did not enhance the presentation.	The visual did not represent of the earth; its development and processes of change in the presentation.
				TOTAL SCORE (OUT OF 30)	

Comments:

Sophomore Science Research Project Visual Aid Rubric and Checklist (Topic B)

Student's Name: _____

	Exceptional (5)	Above Average (4)	Average (3)	Below Average (2)	Fail (0)
Demonstration of Topic	The topic was very well defined by the visual arts medium.	The topic was clearly defined by the visual arts medium.	The topic was defined by the visual arts medium.	The topic was not clearly defined by the visual arts medium.	The topic was not defined by the visual arts medium.
Concepts Presented	Students communicated ideas consistently at a high level of effectiveness in at least one visual arts medium; which signified an understanding of how the communication of their ideas relates to the medium.	Students communicated ideas regularly at a high level of effectiveness in at least one visual arts medium; which signified an understanding of how the communication of their ideas relates to the medium.	Students communicated ideas in at least one visual arts medium; which signified an understanding of how the communication of their ideas relates to the medium.	Students communicated irrelevant ideas using an inappropriate medium; which signified an ineffective understanding of ideas.	Students failed to communicate their ideas; failed to demonstrate an understanding.
Creativity	The visual demonstrated superior creative thought, constructed knowledge, and developed innovative products and processes using a medium.	The visual demonstrated creative thought, constructed knowledge, and developed innovative products and processes using a medium.	The visual demonstrated some creative thought, knowledge, and innovation.	The visual attempted creative thought, knowledge, and/or innovation.	The visual lacked creative thought, knowledge, and/or innovation.
Effort	The visual was well constructed and detailed which demonstrated a great deal of effort.	The visual was constructed with detail which demonstrated sufficient effort.	The visual was constructed with some detail which demonstrated moderate effort.	The visual was constructed with minimal detail which demonstrated little effort.	The visual lacked detail in construction and demonstrates no effort.
Skills	The visual synthesized excellent craftsmanship, skill, and consistency.	The visual synthesized craftsmanship, skill, and consistency.	The visual attempted to demonstrate some craftsmanship, skill, and consistency.	The visual demonstrated very little craftsmanship, skill, and consistency.	The visual lacked any attempt at craftsmanship, skill, and consistency.
Connection to ESS3	The visual was greatly enhanced by the galaxies and their principles throughout time; which left a lasting impression.	The visual was enhanced by the galaxies and their principles throughout time; which left a lasting impression	The visual represented the galaxies and their principles throughout time; but did not leave a lasting impression.	The visual barely represented the galaxies and their principles throughout time; which did not enhance the presentation.	The visual did not represent the galaxies and their principles throughout time in the presentation.
				TOTAL SCORE (OUT OF 30)	

Comments: