



February 23, 2024

Dear Student/Parent/Faculty Member:

You are invited to participate in The Aerospace Corporation's 47<sup>th</sup> annual Robert H. Herndon Memorial Science Competition on **Thursday, May 23<sup>rd</sup>, 2024** at our regional office, located at 14745 Lee Road Chantilly, VA 20152.

The competition is held to evaluate projects and written essays submitted by middle school and high school students. Winners will be selected based on originality and a demonstrated understanding of the subject matter.

In keeping with the long-range goal of this competition, which is to increase diversity in the engineering and science professions, this competition invitation enthusiastically encourages submission of students from diverse backgrounds who show an interest in science or math. All entries will be evaluated by the science competition's steering committee. There are three registration categories: Individual Essay, Individual Experiment, and Team Experiment (3 members max). **Online registration is required for participation.**

Please complete the experiment and essay attendees' registration and abstract forms by not later than the deadline of **April 12<sup>th</sup>, 2024**. Security requirements at our facility require that parent/teacher escorts must provide the last 4-digits of their SSN and bring photo identification for entry. You will be required to submit a Photo media release form and submit your final essay by no later than **May 10, 2024**. Students 18 years old and Faculty advisor/parent escorts must be U.S. citizens to enter the facility.

On Thursday, **May 23<sup>rd</sup>** participants will attend the event at our facility in Chantilly. The schedule for the day includes an orientation, a continental breakfast, experiment judging, technical demonstrations, a luncheon, a keynote address, and the awards presentation. The event will adjourn at approximately 2 p.m. If you have any questions, please call me at (571) 304-3170 or email us: [herndonscience@aero.org](mailto:herndonscience@aero.org).

Sincerely,

Dr. Clyde Moseberry  
Chairperson

# INSTRUCTIONS FOR ESSAY COMPETITORS

## Robert H. Herndon Memorial Science Competition

Winning students will receive prizes. The Essay Evaluation Committee of the Robert H. Herndon Memorial Science Competition will judge all essays. Awards will be given based on the merit of the essay submitted. The essay competition is open to middle and high school students.

To participate in the essay competition, complete the following steps:

1. Submit the following documents by not later than **April 12, 2024**:
  - a. **Attendee Info:**
    - i. Please list participant name and Faculty/Parent contact
    - ii. **Please type information into online form**
  - b. **Essay Abstract instructions.**

Each abstract must contain the following items:

    - i. Category: Choose Chemistry, Computers, Physics, Engineering, Robotics, Aeronautics, Environmental Science, or Biology
    - ii. 100-word (approx.) paragraph describing the selected topic
    - iii. Author's name
    - iv. Author's grade level
  - c. **Media Release Form:**
    - i. All students must provide an individual media release. Download the form and return via email to [herndonscience@aero.org](mailto:herndonscience@aero.org)
2. Submit **FINAL** online, **original** 500-word (minimum) essay by no later than **May 10, 2024**:
  - a. **All essays will be checked for plagiarism prior to judging.** Essays found to be plagiarized will be disqualified and the author may not attend the competition.
  - b. Essays must follow the proper research-paper format, including title page and bibliography or list of references.
  - c. There is a **4-page** length limit for Middle School and **5-page** limit for High School.
    - i. Title page and bibliography do not count towards length limit.
    - ii. Font should be at least 12 point in size and single spaced.
  - d. Student's name should only be on the title page.
    - i. Each school will be assigned an ID number to maintain objectivity during judging.
  - e. Essays must be submitted using the online essay submission form or as a Microsoft Word document e-mail attachment to [herndonscience@aero.org](mailto:herndonscience@aero.org). **Fax and PDF submissions will not be accepted.**
  - f. If your essay includes diagrams submit the Microsoft Word version to: [herndonscience@aero.org](mailto:herndonscience@aero.org).
3. Attend the competition on **May 23, 2024**. You must be present to receive a prize.

Summary: We look forward to receiving your essay registration and abstract by no later than the **April 12<sup>th</sup> deadline**, your final essay by no later than the **May 10<sup>th</sup> essay submission deadline** and seeing you on **May 23<sup>rd</sup>**. If you have any questions, contact: [herndonscience@aero.org](mailto:herndonscience@aero.org).

# SAMPLE FINAL ESSAY FORMAT

The final essay due no later than **May 10<sup>th</sup>** should follow the format shown below. In addition, it should attempt to address the questions listed within each section.

## Section 1: Title Page

- Provide the Student Name and School
- Provide the Essay Title
- Provide the Essay Category [Chemistry / Computer / Physics / Engineering / Robotics / Aeronautics / Environmental Science/ Biology]

## Section 2: Abstract (see instructions on previous page)

- Provide a clear statement of the topic being considered
- Provide a short summary of essay contents and any conclusion you have drawn

## Section 3: Introduction/Background

- Describe the topic or technology
- Discuss the history and evolution of the topic/technology
- Discuss the development of alternative technologies

## Section 4: Main Body (this may contain several subsections)

- Provide a detailed description of topic/technology
- Discuss key current technical directions and challenges
- Discuss applications of the technology (present and future)
- Compare with alternative technologies. Describe the relative advantages/disadvantages
- Provide an example of how/why this technology is beneficial
- Describe future directions of the technology
- Provide a discussion of the business opportunities: what are the most important enabling technologies, more cost-effective alternative enabling technologies.
- Identify the major vendors selling the technology
- Identify the major customers buying the technology
- Identify the important scientists/engineers/companies that have developed the technology
- Describe how this technology impacts society/people (good & bad)

## Section 5: Summary/Conclusion

- Summarize future of the topic/technology
- Include your opinion for possible new/unforeseen applications, problems, or limitations.

## Section 6: Bibliography

- List all reference sources used in the essay and the location of the source
- **\*\*\*Plagiarism is Illegal\*\*\*** Do not copy information directly from a source without referencing the source.
- **Example: In-Text Citation**
  - Human beings have been described as "symbol-using animals" (Burke, 3).  
(Author's Name, Page Number)
- **Example Bibliography Entry**
  - Burke, Kenneth. *Language as Symbolic Action: Essays on Life, Literature, and Method*. Berkeley: University of California Press, 1966.

JUDGES' WORKSHEET FOR ESSAY COMPETITION

(Note: This is just a guide. Record your final scores in the Essay scoring spreadsheet)

	Min				Max	Score
<b>INITIAL PLANNING</b>						
1. Did the student do adequate research on the chosen topic?	0	1	2	3	4	5 _____
2. Has the approach in the essay been well thought out and organized?	0	1	2	3	4	5 _____
3. Was the topic appropriate for the essay competition?	0	1	2	3	4	5 _____
<b>LEVEL OF EFFORT, ORGANIZATION AND INITIATIVE</b>						
4. Has reasonable technical depth been demonstrated for the grade level?	0	1	2	3	4	5 _____
<b>QUALITY OF ANALYTICAL WORK</b>						
5. Has a reasonable hypothesis or analytical model been developed?	0	1	2	3	4	5 _____
6. Is there evidence of creative thinking in the development of the method used?	0	1	2	3	4	5 _____
7. Are the results or conclusions displayed in an easily understood manner?	0	1	2	3	4	5 _____
<b>PRESENTATION</b>						
8. Do the results or conclusion relate back to the hypothesis?	0	1	2	3	4	5 _____
9. Were the conclusions supported by the argument given?	0	1	2	3	4	5 _____
10. Was the report clear, easy to follow and grammatically well-written?	0	1	2	3	4	5 _____
11. Was the student's understanding of the work clearly evident?	0	1	2	3	4	5 _____
					<b>Total Score</b>	_____

# INSTRUCTIONS FOR EXPERIMENT PROJECTS

## Robert H. Herndon Memorial Science Competition

The Aerospace selection committee reviews experiments at local county fairs and invites several projects to attend our in-person Herndon Science Competition (HSC) event. At our HSC event, new judges will award additional first, second, and third place prizes for middle school participants and high school participants.

Invited participants, must complete the following steps to compete in the HSC:

1. Complete/Submit the following documents by **May 3<sup>rd</sup>, 2024**:
  - a. **Participants List:**
    - i. Please complete the online registration form with all team members names (3 max)
  - b. **Project Abstract:**
    - i. Please submit a written project abstract (see example abstract on page# 7)
    - ii. **Variations of previous HSC experiments entered within the last 3 years WILL NOT be accepted**
  - c. **Media Release Form:**
    - i. All students must provide an individual media release form. Please download form and return via email to [herndonscience@aero.org](mailto:herndonscience@aero.org)
2. **DO NOT** put your school name on clothing, experiment project or any printed materials the judges will see.
  - a. **DO NOT** reveal your school name during your presentation.
  - b. Each school will be assigned an ID number to maintain objectivity during judging.
3. Attend the competition on **May 23<sup>rd</sup>, 2024**. You must be present to receive a prize

Please use the included Experiment Judge's Worksheet as a resource to see exactly what the judges are looking for when they are evaluating your project and presentation.

We look forward to your participation and to seeing you on **May 23<sup>rd</sup>**. If you have any questions, contact: [herndonscience@aero.org](mailto:herndonscience@aero.org).

## **SAMPLE EXPERIMENT ABSTRACT**

### Robert H. Herndon Memorial Science Competition

School Name:

Faculty Advisor:

School Address:

School Phone:

Project Category: Environmental Science

The (school name) Project Team will explore the technical and financial feasibility of powering a house solely from solar energy. Solar energy will replace the “grid” connection to electricity and natural gas. To determine technical feasibility, we will construct a model house (that will fit on a 3 X 6 table) that will have all the wiring and conduits needed to provide sufficient electricity, room heat, and water heat from solar sources only. To demonstrate financial feasibility, we will conduct a six-week survey of electricity and natural gas usage at our homes, determining the cost of the power used, the maximum daily kilowatt-hours and the peak instantaneous load. We will also investigate the cost of a solar-powered system to replace these requirements and determine the payback time, assuming an 8% per annum cost.

# JUDGE'S WORKSHEET FOR 2024 HERNDON SCIENCE EXPERIMENT COMPETITION

PROJECT ID# \_\_\_\_\_

TITLE OF PROJECT: \_\_\_\_\_

	Min	Max	Score
<b>1. ORIGINALITY</b> <i>In terms of the scientific method, is the experiment original? Did it involve new approaches to solving an old problem?</i>	0	1 2 3 4 5	_____
<b>2. COMPREHENSION OF THE PROBLEM</b> <i>Did the project adequately summarize the nature of the overall problem with appropriate use of scientific theory, terms, techniques, and methodologies?</i>	0	1 2 3 4 5	_____
<b>3. ORGANIZATION AND COMPLETENESS</b> <i>Did the project have a well defined goal(s) or objective(s)? Did the presentation exhibit thoroughness?</i>	0	1 2 3 4 5	_____
<b>4. APPROPRIATE SOLUTION</b> <i>Were different approaches for solving each problem or objective evaluated and was the appropriate solution selected?</i>	0	1 2 3 4 5	_____
<b>5. PROJECT OBJECTIVES</b> <i>Did the experiment meet the defined main objective(s) of the project?</i>	0	1 2 3 4 5	_____
<b>6. EFFORT AND MOTIVATION</b> <i>Was it evident that sufficient time and effort were spent in learning the required subject matter germane to the main project objective?</i>	0	1 2 3 4 5	_____
<b>7. DISPLAY</b> <i>Were the visual displays clearly presented? Was it easy to understand the project without any verbal explanation?</i>	0	1 2 3 4 5	_____
<b>8. ORAL PRESENTATION</b> <i>Did each team member's oral presentation demonstrate a thorough understanding of the project? Was the presentation completed within the allotted time?</i>	0	1 2 3 4 5	_____
<b>9. QUESTIONS &amp; ANSWERS</b> <i>Did answers to questions demonstrate each team member's thorough understanding of the project?</i>	0	1 2 3 4 5	_____

Total Score \_\_\_\_\_