



February 23, 2024

Dear Student/Parent/Faculty Member:

You are invited to participate in The Aerospace Corporation's 47th Annual Robert H. Herndon Memorial Science Competition on **Thursday, May 23, 2024**.

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. Project teams may have up to 5 members each. If a school chooses to submit multiple projects, only one project per school may win a prize. Each school may submit up to 6 essays. Essays are to be written individually.

In keeping with the long-range goal of this competition, which is to increase diversity in the engineering and science professions, this competition is open to students from diverse backgrounds who show an interest in science or math. All entries will be evaluated by the science competition's steering committee. **Online registration is required for participation.**

Security requirements at our facility require that each faculty advisor bring photo identification. Please complete the experiment and essay attendees' forms by **March 8th, 2024**. Please indicate **adult** attendees who are not U.S. citizens. Non-citizens will be required to show a green card or a passport to gain access to our facilities. A teacher or other faculty member must accompany students to the event.

We will arrange for a certified bus to transport participating students and the faculty advisor to our campus. The schedule for the day includes an orientation, a continental breakfast, experiment judging, laboratory tours, 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 (310) 336-6763 or email us: herndonscience@aero.org.

Sincerely,

Oliver Ambrosia
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 **March 8th, 2024**:
 - a. **Attendee Info:**
 - i. Please list participant name and Faculty/Parent contact
 - ii. **Please type information into online form**
 - b. **Essay Abstract** containing:
 - i. Category: Chemistry, Computers, Physics, Engineering, Robotics, Aeronautics, Environmental Science, 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 form and return via email to herndonscience@aero.org
2. Submit **FINAL** online, **original** 500-word (minimum) essay by **April 26, 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.
 - e. Essays must be submitted electronically as a Microsoft Word document file e-mail attachment to herndonscience@aero.org . **Fax and PDF submissions will not be accepted.**
3. Attend the competition on **May 23rd, 2024**. You must be present to receive a prize.

We look forward to your participation and to seeing you on May 23rd. If you have any questions, contact: herndonscience@aero.org.

SAMPLE ESSAY FORMAT

The essay should follow the format shown below. In addition, 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 example 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	
INITIAL PLANNING							
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	___
LEVEL OF EFFORT, ORGANIZATION AND INITIATIVE							
4. Has reasonable technical depth been demonstrated for the grade level?	0	1	2	3	4	5	___
QUALITY OF ANALYTICAL WORK							
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	___
PRESENTATION							
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	___
						Total Score	___

INSTRUCTIONS FOR EXPERIMENT TEAMS

Robert H. Herndon Memorial Science Competition

The competition concentrates on the team project concept in the belief that learning is enhanced by the group method. Each member of the winning team will be awarded a prize. A first, second, and third place team will be selected for middle school participants and high school participants.

The Aerospace selection committee reviews experiment abstracts to determine which experiments will be invited to participate in the final judging. Qualifying experiments will be accepted in the order in which they are received until the maximum number of entrants is reached. Upon an experiment's acceptance into the Competition, schools may request an Aerospace Advisor and may request a stipend (up to \$150 per school) for the purchase of materials for the experiment.

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

1. The faculty advisor selects a team of up to **5** students for the experiment. Team members will be verified one week prior to the event.
2. Submit the following documents by **March 8th, 2024**:
 - a. **Attendees List:**
 - i. Please complete the online registration form with all team members (5 max)
 - b. **Project Abstract:**
 - i. Please submit a written project abstract (see example abstract on page# 6)
 - ii. **Variations of previous HSC experiments entered within the last 3 years WILL NOT be accepted**
 - c. **List of Required Materials:**
 - i. Please list materials required for your experiment on the form provided.
 - ii. Aerospace will reimburse up to \$150 for project materials. (Max one stipend per school)
 - d. **Media Release Form:**
 - i. All students must provide an individual media release form. Please download the form and return via email to herndonscience@aero.org
3. **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.
4. Prepare & rehearse a presentation for live, in-person judging. Each team will present a **six to eight** minute oral presentation discussing their hypothesis, assumptions, experiment setup, analysis, and conclusions. Our judges will review all projects.
5. Attend the competition on **May 23rd, 2024**. You must be present to receive a prize.

Please use the included Experiment Judge's Worksheet (see page# 8) as a resource to see exactly what the judges are looking for when they are evaluating your project and presentation.

CANCELATION POLICY: In case you are unable to attend the event and you have received a stipend you are obligated to return said stipend.

We look forward to your participation and to seeing you on May 23rd. If you have any questions, you may contact Oliver Ambrosia at (310) 336-6763.

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

Total Score _____