

January 07, 2011

Dear Faculty Member / Science Dept. Chair / Principal:

You are invited to participate in The Aerospace Corporation's 34th annual Robert H. Herndon Memorial Science Competition on Thursday, April 14, 2011 at our Chantilly, VA office, located at 15049 Conference Center Drive, Chantilly, VA 20151.

The competition is held to evaluate science projects and written essays submitted by middle school and high school students. Each participating school will have an advisor assigned from The Aerospace Corporation to provide assistance to the students and faculty. The requirements for submitting a science experiment are explained in Attachment 1. The requirements for submitting a science essay are provided in Attachment 5. Winners will be selected on the basis of originality and a demonstrated understanding of the subject matter.

In keeping with the long-range goal of this seminar, which is to increase diversity in the engineering and science professions, we are asking for your cooperation in selecting students of diverse backgrounds who show an interest in science or math. Each school is invited to send one faculty advisor and a maximum of 10 students to the competition. A maximum of **four** students may be on an experiment team, and a maximum of six students may submit essays. Students must either submit an essay or be part of the experiment team to attend the competition on April 14. **Members of winning experiment teams and authors of winning essays must be present on April 14 to be eligible to receive their prizes.** For science experiments, prizes will be awarded to the First, Second and Third place teams. Each member of a winning team will receive an individual prize. For essay authors prizes will be awarded for First and Second place winners based on the merit of the essay content. Executive management of The Aerospace Corporation will judge experiments, and essays will be evaluated by the science competition's steering committee.

Security requirements at our facility require that each faculty advisor bring photo identification with him or her. Please complete and return the essay and experiment attendees list by **Feb 28**. Please indicate those 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.

The schedule for the day includes 9 a.m. registration and a continental breakfast, orientation, experiment judging, laboratory tours, a luncheon, a keynote address, the awards presentation and a reception. The event will adjourn at approximately 2 p.m. If you have any questions, please call me at 571-307-7008.

Sincerely,

Peggy Tatum  
2011 East Coast Chairperson,

Attachments:

1. Instructions for Experiment Teams
2. Experiment Attendees
3. List of Required Experiment Materials
4. Sample Experiment Abstract
5. Instructions for Essay Competitors
6. Essay Attendees
7. Sample Title Page
8. Sample Essay Abstract
9. Sample Research Paper Format
10. Media Release Form

# 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.

### EXPERIMENTS

	<u>Middle School</u>	<u>High School</u>
<b>1<sup>st</sup> Place Team Members</b>	<b>4 member team</b>	<b>4 member team</b>
<b>2<sup>nd</sup> Place Team Members</b>	<b>4 member team</b>	<b>4 member team</b>
<b>3<sup>rd</sup> Place Team Members</b>	<b>4 member team</b>	<b>4 member team</b>

Due to space limitations, we can accept only one experiment per school. 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 will be assigned an Aerospace Advisor who will issue a check (up to \$150 per team) for the purchase of materials for the experiment and administer employment applications.

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

1. The faculty advisor selects a team of up to **4** students for the experiment.
2. The experiment team submits a list of required materials with the associated costs. (Aerospace will pay for the required materials, up to \$150 per team)
3. It is required that the team prepares an abstract of their selected project, which is due in our office by **February 28, 2011**.
4. The faculty advisor should review the abstract for suitability and originality.
5. The experiments must fit on a 3-foot by 6-foot table for display purposes.
6. Each student's name and a list of required materials are due to our offices by **February 28, 2011**.
7. Attend the Competition on **April 14, 2011**.

The teams and their projects will be transported to our facility for final evaluation and demonstration. Project presentations should include a display board with the proper research format. Each team should be prepared to make a four to six minute oral presentation discussing their hypothesis, assumptions, experiment set-up, analysis, and conclusions. Our judges will review all projects and select first through third place teams.

We look forward to your participation and to seeing you on April 14. If you have any questions, you may contact Peggy Tatum at 571-307-7008.

**Email/FAX forms to:** The Aerospace Corporation  
Attn.: Peggy Tatum – CH1-230  
Fax # 571-307-1716  
[peggy.tatum@aero.org](mailto:peggy.tatum@aero.org)

# EXPERIMENT ATTENDEES

## Robert H. Herndon Memorial Science Competition

School \_\_\_\_\_ Date \_\_\_\_\_

Please print first and last name, address.

1. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

2. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

3. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

4. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

Faculty Advisor Name : \_\_\_\_\_

Faculty Advisor Telephone: \_\_\_\_\_

Faculty Advisor E-Mail Address: \_\_\_\_\_

Return completed form by February 28, 2011

# LIST OF REQUIRED EXPERIMENT MATERIALS

Robert H. Herndon Memorial Science Competition

School Name: \_\_\_\_\_

Faculty Advisor: \_\_\_\_\_

School Address: \_\_\_\_\_

\_\_\_\_\_

School Telephone: \_\_\_\_\_

## PROJECT CATEGORY

(Select one)

- |                           |                 |
|---------------------------|-----------------|
| (a) Chemistry             | (b) Computer    |
| (c) Physics               | (d) Engineering |
| (e) Robotics              | (f) Aeronautics |
| (g) Environmental Science |                 |

Item(s) Requested	Quantity	Estimated
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
	<b>Total</b>	<b>\$ _____</b>

Please list all items you will need on the day of the event (electrical outlet, water, Internet access, etc.) \_\_\_\_\_

Faculty Advisor \_\_\_\_\_

(Signature)

Return completed form by February 28, 2011

# **SAMPLE EXPERIMENT ABSTRACT**

## Robert H. Herndon Memorial Science Competition

School Name:

Faculty Advisor:

School Address:

School Phone:

School FAX:

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 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 of money.

# INSTRUCTIONS FOR ESSAY COMPETITORS

## Robert H. Herndon Memorial Science Competition

Winning students will receive U. S. Savings Bonds. 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.

### ESSAYS

**1<sup>st</sup> Place      1 Author**  
**2<sup>nd</sup> Place      1 Author**

The essay competition is open to middle and high school students. A maximum of six entrants per school is allowed.

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

1. Submit an abstract that contains:
  - (a) 100-word (approx.) paragraph describing the selected topic
  - (b) Author's name
  - (c) Author's grade level

The abstract must be submitted by **February 28, 2011**.

2. Submit an **original** 500-word (approx.) essay in one of the following areas:
  - (a) Chemistry
  - (b) Computer
  - (c) Physics
  - (d) Engineering
  - (e) Robotics
  - (f) Aeronautics
  - (g) Environmental Science

The final essay must be submitted by **April 1, 2011**. Plagiarism is strictly prohibited.

3. All entries must be typed and double-spaced. (Note: Student name should only be included on the Essay title page.)
4. **Essays must follow the proper research-paper format, including Title page, and bibliography or list of references.**
5. Attend the Competition on April 14, 2011.

We look forward to your participation and to seeing you on April 14. If you have any questions, you may contact Peggy Tatum at 571-307-7008.

**Email/FAX forms to:** The Aerospace Corporation  
Attn.: Peggy Tatum – CH1-230  
Fax # 571-307-1716  
[peggy.tatum@aero.org](mailto:peggy.tatum@aero.org)

# ESSAY ATTENDEES

## Robert H. Herndon Memorial Science Competition

School \_\_\_\_\_ Date \_\_\_\_\_

Please print first and last name, address.

1. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

2. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

3. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

4. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

5. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

6. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

Faculty Advisor Name: \_\_\_\_\_

Faculty Advisor Telephone: \_\_\_\_\_

Faculty Advisor E-Mail Address: \_\_\_\_\_

Return completed form by February 28, 2011

# Essay Title

[Indicate WHICH CATEGORY you are submitting for]

[Chemistry / Computer / Physics / Engineering / Robotics / Aeronautics /  
Environmental Science]

Your Name: **(Do Not Include SS#)**

Essay Category:

Faculty Advisor:

Grade Level:

School Name:

School Address:

School Phone:

School FAX:

Abstract

# **SAMPLE ESSAY ABSTRACT**

## **Robert H. Herndon Memorial Science Competition**

### **The Need for a Renewable Fuel**

The United States needs to find a new source of fuel. Oil, unfortunately, is a finite resource that is itself imperiling the survival of life on the planet. Unless oil consumption in the United States is reduced, the nation's reliance on oil from the other parts of the world, especially the Middle East, will continue. (Two-thirds of all the known oil reserves in the world lie in the Middle East. Only about 4 percent lie in North America.) This tragic irony makes it abundantly clear that unless the energy economy of the United States and other industrialized countries changes dramatically, the world is headed for a bleak future of oil wars, oil spills, global warming and polluted air and water. The only question left to ask is, what alternative is not as polluting as gasoline, cost efficient, abundant, and can please both the public and businesses?

There are several alternatives to gasoline, such as liquid-alcohol fuels, ethanol, electricity, coal, nuclear power, wind-generated and solar energy, but there are some drawbacks to these alternatives. The two energy sources that best fit the ideal description of the perfect fuel would be wind-generated and solar energy. Are they going to be the future fuel of this nation?

The essay should follow the format shown below. In addition, attempt to address the questions listed within each section.

**Section 1: Title Page (Do Not Include SS#)**

- Provide Student Name and School
- Provide Essay Title

**Section 2: Abstract (see example previous page)**

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

**Section 3: Introduction / Background**

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

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

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

**Section 5: Summary/Conclusion**

- Summarize future of the topic/technology
- 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: U of California P, 1966.



January 07, 2011

Dear Parents,

The Aerospace Corporation has launched the Robert H. Herndon Memorial Science Competition Web site. Our goal is to provide a resource that promotes this annual competition and provides a way to distribute information about registering for the event. The Internet offers a vast opportunity for resource sharing, innovation, and communication. With this opportunity comes responsibility.

Because photographs captured during past competitions will be incorporated in this new site, we request your permission to use your child's image.

I, \_\_\_\_\_, the parent or legal guardian of \_\_\_\_\_ grant The Aerospace Corporation permission to use my child's image captured in photographs, film, recordings, and/or any other materials associated with their participation in the Herndon Memorial Science Competition for both internal and external publicity purposes without restrictions and without time-of-use limitations. I also agree there will be no compensation for such use.

Signature of Parent/Guardian \_\_\_\_\_ Date \_\_\_\_\_

Please read the above agreement carefully before signing. If you have questions about it, please contact me at your earliest convenience. My telephone number is 310. 336.6763.

Sincerely,

Oliver Ambrosia  
2011 Herndon Science Competition  
The Aerospace Corporation

CC: Alonzo Prater

**MEDIA RELEASE FORM IS REQUIRED TO COMPLETE APPLICATION  
SUBMISSION**

**Return completed form by February 28, 2011**