

January 28, 2008

Dear Faculty Member / Science Dept. Chair / Principal:

You are invited to participate in The Aerospace Corporation's 31st annual Robert H. Herndon Memorial Science Competition on Thursday, June 5, 2008 at our corporate headquarters, located at 2350 E. El Segundo Boulevard in El Segundo, California.

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 11 students to the competition. A maximum of **five** 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 June 5. Members of winning experiment teams and authors of winning essays must be present on June 5 to be eligible to receive their prizes. For science experiments, each member of a winning team will be awarded a U.S. Savings Bond ranging from \$200 to \$1000, depending on the team's final placement. Authors of the winning essays will receive a \$250 bond or a \$500 bond, depending on the essay's final placement. Furthermore, the first place high school winners have the potential of being offered summer employment positions at the company. 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 March 10. 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.

We will arrange for a certified bus to transport participating students and the faculty advisor to our offices by 8:30 a.m. for registration. You will be contacted at a later date with the exact time and pick-up location. 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) 336-8803.

Sincerely,

Terita R. Norton
2008 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

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 U.S. Savings Bond. A first, second, and third place team will be selected for middle school participants and high school participants. The face values of the savings bonds are as follows:

EXPERIMENTS

	<u>Middle School</u>	<u>High School</u>
1st Place Team Members	\$1,000.00	\$1,000.00
2nd Place Team Members	\$500.00	\$500.00
3rd Place Team Members	\$200.00	\$200.00

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 \$100 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 **5** 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 \$100 per team)
3. It is required that the team prepares an abstract of their selected project, which is due in our office by March 10, 2008.
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 social security number, and a list of required materials are due to our offices by March 10, 2008.
7. Attend the Competition on June 5, 2008.

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 June 5. If you have any questions, you may contact Terita Norton at (310) 336-8803.

Mail/FAX forms to: The Aerospace Corporation
Attn.: Terita Norton – M8/234
P.O. Box 92957
Los Angeles, CA 90009-2957
Fax # (310) 563-3900

EXPERIMENT ATTENDEES

Robert H. Herndon Memorial Science Competition

School _____ Date _____

Please print first and last name, address and social security number.

1. Name: _____
Address: _____
Phone: _____
Email: _____
SS#: _____

2. Name: _____
Address: _____
Phone: _____
Email: _____
SS#: _____

3. Name: _____
Address: _____
Phone: _____
Email: _____
SS#: _____

4. Name: _____
Address: _____
Phone: _____
Email: _____
SS#: _____

5. Name: _____
Address: _____
Phone: _____
Email: _____
SS#: _____

Faculty Advisor Name: _____

Faculty Advisor Telephone: _____

Faculty Advisor E-Mail Address: _____

Return completed form by March 10, 2008

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
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
	Total	\$ _____

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 March 10, 2008

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. The face values of the savings bonds are as follows:

ESSAYS

1st Place	\$500.00
2nd Place	\$250.00

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 and SSN
 - (c) Author's grade level

The abstract must be submitted by March 10, 2008.

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 23, 2008. Plagiarism is strictly prohibited.

3. All entries must be typed and double-spaced.
4. Essays must follow the proper research-paper format, including Title page, and bibliography or list of references.
5. Attend the Competition on June 5, 2008.

We look forward to your participation and to seeing you on June 5. If you have any questions, you may contact Terita Norton at (310) 336-8803.

Mail/FAX forms to: The Aerospace Corporation
Attn.: Terita Norton – M8/234
P.O. Box 92957
Los Angeles, CA 90009-2957
Fax # (310) 563-3900

ESSAY ATTENDEES

Robert H. Herndon Memorial Science Competition

School _____ Date _____

Please print first and last name, address and social security number.

1. Name: _____
Address: _____
Phone: _____
SS#: _____
Email: _____

2. Name: _____
Address: _____
Phone: _____
SS#: _____
Email: _____

3. Name: _____
Address: _____
Phone: _____
SS#: _____
Email: _____

4. Name: _____
Address: _____
Phone: _____
SS#: _____
Email: _____

5. Name: _____
Address: _____
Phone: _____
SS#: _____
Email: _____

6. Name: _____
Address: _____
Phone: _____
SS#: _____
Email: _____

Faculty Advisor Name: _____

Faculty Advisor Telephone: _____

Faculty Advisor E-Mail Address: _____

Return completed form by March 10, 2008

Essay Title

[Indicate WHICH CATEGORY you are submitting for]

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

Your Name:

Essay Category:

Faculty Advisor:

Grade Level:

School Name:

School Address:

School Phone:

School FAX:

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: 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 2: Introduction / Background

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

Section 3: 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 4: Summary/Conclusion

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

Section 5: 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.