2012 NOAC Science Fair

In conjunction with the first-ever Science, Technology, Engineering and Mathematics (STEM) program at the NOAC Adventure Central area, the 2012 NOAC Science Fair gives Arrowmen an opportunity to showcase their knowledge of STEM areas to a national audience. Tied to the Adventure Central theme of "cool adventure," the NOAC Science Fair assists in highlighting the Boy Scouts of America's NOVA Awards program, which incorporates learning with cool activities and exposure to science, technology, engineering and mathematics for Cub Scouts, Boy Scouts, and Venturers. The hope is that the requirements and activities for earning the NOVA Awards stimulates interest in STEM-related fields and shows how science, technology, engineering and mathematics apply to everyday living. The NOAC Science Fair activity may be just the jumpstart you need to start earning a NOVA Award.

Participation in the NOAC Science Fair is very simple and requires three (3) tasks:

1. Decide on a topic, formulate a hypothesis, and do the research.
2. Create a display board summarizing the results of your project.
3. Bring that display to the NOAC Science Fair and complete for the awards!

Questions?

Contact the NOAC Science Fair Coordinator, Scott Valcourt, via email to nsf@ne1a.org. See you at NOAC!

Arrowmen may compete individually, or in teams of 2 or 3 Arrowmen. Please let us know that you are planning to participate in the NOAC Science Fair by sending a brief email to nsf@ne1a.org (Scott Valcourt, NOAC Science Fair Coordinator) by July 30 with the following information about your competition display: Name, Lodge/Council, Display Title, Do you need 110VAC power?, Do you need WiFi Internet access?

Topics, Hypothesis and Research

In order to create a great NOAC Science Fair display, the Scientific Method is the logical process to arrive at the best answer to the hypothesis (problem statement/question of study). Consider asking yourself the following questions based on your intended topic: Will…? How will…? Does…? Is…? Can…? What amount…? What…? How much…? Some examples include:

"Can Houseflies Distinguish Between Artificial Sweeteners and Sugar?"

"How does soil type affect erosion?"

"What is the effect of different surfaces on echoes?"

When you have narrowed your topic, develop your hypothesis, which is a statement that outlines a possible explanation to your problem or question. The hypothesis shouldn't necessarily be the exact answer to your problem, but it should guide your experiments and investigation. Some examples include:

"I think the houseflies will be able to distinguish sugar from artificial sweeteners. If houseflies can distinguish artificial sweeteners from sugar, then they will respond or behave in a different manner when fed with the two different substances."

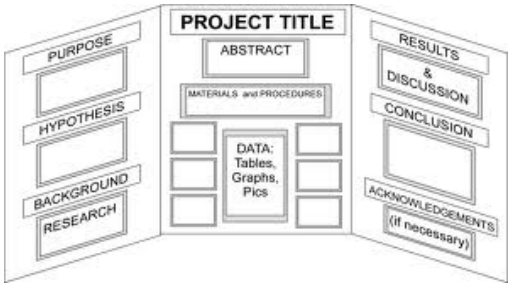
"I think loose soil type increase the amount of erosion by 50% compared to compact soil."

"I think the harder surfaces create louder echo by as much as twice compared to soft surfaces."

Then, do your research and carry out your experiments. Keep good notes and gather factual information about the problem and test the hypothesis. Conduct your experiments, observe and collect data. Then, record and analyze your data and draw conclusions. Maybe you might have to redo an experiment or create a new experiment to be sure of your results.

NOAC Science Fair Display Board

Once your project is complete, synthesize your activity onto a single display board. A typical display board can be acquired from an office supply store for under $10 and is of a tri-fold design that opens to 36" x 48".



When organizing your display board, please follow these handy style guidelines to ensure maximum effect of your display:

- Text and subtitles are at least 2-inches high and use a clearly visible font.
- Text on the display is at least 14-point font size and double spaced.
- Charts, drawings, diagrams and photos are all labeled.
- Bibliography contains at least 3 sources, though more is always better.
- The display must contain a title, question/problem of the study, hypothesis, background information, experiments, results and data, analysis, conclusion, and bibliography.
- The display must be stand-alone with a three-sided shape, must sit completely on a tabletop with dimensions of 30" deep and 48" wide and must not exceed the resting height of 8 feet.
- NOAC Science Fair displays must conform to the safety rules identified in this booklet. (See Safety Rules)

The NOAC Science Fair

The NOAC Science Fair will take place in Munn Arena from Wednesday through Friday during NOAC. Tuesday is the NOAC Science Fair setup day, and all displays should be brought to the Munn Arena between 1:00pm and 5:00pm on Tuesday, July 31. The NOAC Science Fair will operate on Wednesday and Thursday from 11:30am to 5:00pm, which is when judging will take place. On Friday during Founder's Day, the NOAC Science Fair will operate from 10:30am to 4pm, with awards being announced at 2:00pm. Between 4:00pm and 5:00pm, all displays should be collected from the NOAC Science Fair, along with awards. Arrowmen do not need to be present at the NOAC Science Fair to compete or participate--the display should provide all of the material required for judges to make a determination of performance.

2012 NOAC Science Fair Safety Rules
(Adopted from LA County of Education Science Fair Committee)

Part 1: Living Organisms

- Displays of bacterial/viral cultures, molds, and live or preserved animals and plants are not permitted.
- Tissues, blood, or blood products will not be displayed.
- Nutrient, blood or any other agar will not be displayed.
- Display photographs showing procedures detrimental to the health and well-being of the vertebrate animals will not be allowed.
- No living, dead or preserved plants.
- No living, dead or preserved animals.
- No animal parts, fresh or preserved.
- No photographs of dissection.
- No cultures of any bacteria or molds to be displayed.
- No fruits, vegetables, or any perishable food item to be displayed.

Part 2: Hazardous Materials:

- No toxic materials will be displayed.
- No acids or bases maybe displayed.
- No explosives or flammable substances will be displayed.
- No consumable alcohol, tobacco, drugs or medications will be displayed.
- No corrosive, flammable, or toxic chemicals.
- No open containers or any liquid.
- No unlabeled containers.

Part 3: Electric Hazards:

- Automotive-type wet well batteries are not permitted.
- Electrical equipment, operating on more than 12 volts with unshielded connections are not allowed.

Part 4: Electrical Requirements:

- Projects that require 110-Volt/60Hz supply will be allowed a maximum of 500 watts.
- Projects using 110-volt electrical current must have all wires and connections well-shielded.

Part 5: Equipment Display:

- Microscopes, computers, or lasers, if used in the initial display, are done so in the student's risk.

Part 6: DO NOT DISPLAY:

- Anything that cannot afford to be lost (electrical balances, compressors, electric meters, operable lasers)
- Hypodermic syringes, sharp items such as knives, razor blades, and dissection kits
- Laboratory equipment that is not necessary for understanding of the project
- Contraband and regulated substances

2012 NOAC Science Fair Judging of the Projects
(Adapted from Robert E. Perry Math/Sci/Tech Magnet School Science Fair)

Judging of the NOAC Science Fair Display Boards and content will take place over the period of Wednesday and Thursday of NOAC, with the final awards announced on Founder's Day (Friday) at NOAC.

Judging and Grading Criteria	Points
1. **Problem of the Study**	
a. Is the problem stated in the form of a question?	5
2. **Background Research**	
a. Does the background research match the problem?	15
b. Is there an appropriate bibliography?	5
3. **Hypothesis**	
a. Is the educated guess based on a good research?	5
4. **Experiment**	
a. Are all materials required to do the experiment listed with the amounts needed?	5
b. Are all the steps written in a concise and understandable manner?	5
c. Is there a control group for comparison?	5
d. Could this experiment be duplicated exactly as described?	5
e. Does the experimental set-up contain minimum variables?	5
f. Are there many sampling/ testing/ trials done to arrive at a valid conclusion?	5
g. Are there any displays of photos of the actual experiment?	5
5. **Presentation of Results**	
a. Are the results presented quantitatively?	5
b. Are the results presented for each sample or trial?	5
c. Are the results for each trial averaged?	5
d. Are the results clearly presented in tables or charts?	5
e. Are the results clearly presented in appropriate graphs?	5
6. **Conclusion and Discussion**	
a. Do the conclusions accurately reflect (or based on) the results of the experiment?	5
b. Do the conclusions answer the question of the study?	5
c. Is the meaning (or implications) of the results clearly discussed and explained?	5
7. **Presentation**	
a. Is the project neat? (cutting, gluing, arrangement of parts)	5
b. Does the project display use color appropriate to the study?	5
c. Are the font styles readable and follow format?	5
d. Are the headings and title readable and follow format?	5
e. Are there actual photos that help enhance the project?	5
8. **Additional Factors**	
a. Is the project exceptionally creative?	5
b. Is the project exceptionally neat?	5
c. Does the project involve exceptional technical skills?	5
d. Does the project have additional reports?	5
e. Does the project show additional diagrams or photos?	5
f. Does the project have models allowed for display?	5
TOTAL POSSIBLE SCORE	160