

2022 NOAC Science Fair



In conjunction with the Science, Technology, Engineering and Mathematics (STEM) program and as a part of the NOAC Adventure Central area, the Fourth NOAC Science Fair at NOAC 2022 gives OA Members an opportunity to showcase their knowledge of STEM areas to a national audience. 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 stimulate interest in STEM-related fields and show 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 compete for the awards!

Questions?

Contact the NOAC Science Fair Coordinator, Nan Jordan, via email to nsf@arrowtour.org. See you at NOAC!

Delegates may compete individually, or in teams of 2 or 3 Delegates. Please let us know that you are planning to participate in the NOAC Science Fair by sending a brief email to nsf@arrowtour.org (Nan Jordan, NOAC Science Fair Coordinator) by July 22 with the following information about your competition display: Name, Lodge/Council, Display Title, Do you need 120VAC 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."

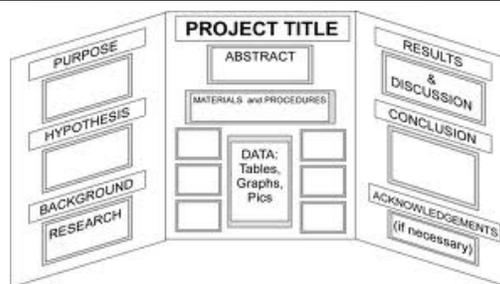
⇒ "I think loose soil type increases the amount of erosion by 50% compared to compact soil."

⇒ "I think the harder surfaces create louder echo by as much as two times 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. 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 36" x 48" tri-fold display board can be acquired from an office supply store or a craft store for under \$10.



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, double spaced.
- Charts, drawings, diagrams and photos are all labeled.
- Bibliography contains at least 3 sources; more is always better.
- Display must contain a title, question/problem of the study, hypothesis, background information, experiments, results and data, analysis, conclusion, and bibliography.
- 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 the STEM Adventures area from Tuesday through Thursday during NOAC. Tuesday, July 26 is setup day, and all displays should be brought to the STEM area at the World's Fair Expo Hall A between 1:00pm and 5:00pm. The NOAC Science Fair will operate on Wednesday and Thursday from 1:00pm to 5:00pm at the World's Fair Expo Hall A, which is when judging will occur. On Friday, July 29, awards will be presented. All displays should be collected from the NOAC Science Fair on Friday between 10am and 12pm. Delegates 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.

Getting the Display to NOAC: Displays may travel with contingents or be shipped in advance of NOAC. The NOAC shipping address can be provided via an email to nsf@arrowtour.org.

2022 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 Friday morning.

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 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 an appropriate control group for comparison?	5
d. Could this experiment be duplicated exactly as described?	5
e. Does the experimental set-up minimize confounding variables?	5
f. Are there multiple 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 appropriate tables, charts or graphs?	5
e. Is there a statistical analysis of data?	5
6. Conclusion and Discussion	
a. Do the conclusions accurately reflect (or are they based upon) the results of the experiment?	5
b. Do the conclusions respond to 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 consistent?	5
d. Are the headings and title readable and consistent?	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	<u>160</u>