GENEVA ACADEMY
Distinctive Classical Christian Learning

SCIENCE PROJECT & RESEARCH PAPER TIMELINE

FOR PARTICIPANTS OUTSIDE THE SCHOOL BODY

Logic and Rhetoric levels (7th - 12th Grade)

Geneva Academy has an invested interest in giving God glory as it teaches and prepares students to experience the joys of scientific discovery – unraveling the way God created everything and how it works together for His purpose and glory. We believe that students truly grow in their scientific interest and ability as they become able to articulate a question and develop their scientific skills of observing, hypothesizing, experimenting, collecting and analyzing data and communicating results in a proficient manner. We believe that it gives God glory to equip students to be able to participate in scientific investigations, discussions and present their findings before an audience to the glory of the One who created it all.

As a Classical Christian School, the Science Fair also provides a venue for students to articulate what they have learned and discovered to those around them. It also provides an opportunity for them to defend their procedure and results – these are both abilities that are valued in the Logic and Rhetoric stages of Classical Christian education. Students will be making an oral presentation in class and will have to answer discussion questions posed by other students.

Home-school students who participate are encouraged to be part of these oral presentations during classtime for feedback before presenting orally before a larger audience.

General Guidelines for the Science Fair Project:

1. The topic should reflect age and ability. Various websites may be perused at leisure and ideas can be gathered together (http://sciencebuddies.com is a really good one). However, students must try to make the study an experiment they make their own as much as possible. To make it personal, they should try to alter an experiment they find in the field they desire to study. Of course, as the writer of Ecclesiastes states, "There is nothing new under the sun," but students should try to make the project as original to them as possible.

2. Students in the upper grades should base their experimental question off of research they have done and ensure their research is reflected in the progress of their paper. It should affect their project and not be a completely separate component.

3. The research papers must be documented adequately and the number of sources used should increase according to ability (see the guidelines). MLA style works-cited page format is expected for all research papers.

4. Geneva Academy will follow the "International Pre-College Scientific Research" Science Fair rules outlined by as much as possible. However, we will not require that a qualified scientist be involved, although, if possible it is encouraged. Nor will we adhere to all of the eligibility requirements. These rules are quite extensive and are outlined at https://student.societyforscience.org/international-rules-pre-college-science-research?pid=282

5. The rules basically contain guidelines to protect the welfare of the student researcher, protect the rights and welfare of the human participant, ensure adherence to federal regulations, ensure use of safe laboratory practices, protect the environment and determine eligibility for competition in the Intel ISEF 2015. There are special rules and permissions needed for working with human participants, vertebrate animals, potentially hazardous biological agents, and hazardous chemicals. We will not necessarily require official permission (needed from an SRC (Science Review Committee) and board) but we will encourage students to adhere to the basic guidelines as much as possible. This way, if students so want to enter an Intel Science Expo, they will be familiar with the accepted guidelines and be able to participate easily.

6. Projects that are demonstrations, 'library' research or informational projects, "explanation" models or "kit" building are not appropriate as projects for the Science Fair; *they must have an experimental component.*

7. Quantitative data and results will be representative of several trials and/or from an adequate sample, depending on what kind of experiment is being done. It should be well-thought out and not something that can be "thrown together" at the last minute. Students should have their project approved by December 15 to ensure adequate time for revisions and "do-overs" as needed in their project. Access to a library will be needed for the research paper component of the project – this is something parents should plan on for their student. All data, experiments, dates, notes and procedure adjustments should be recorded in a lab journal or notebook which will be presented along with the display to the science fair judges.

8. Students outside Geneva who are participating, may bring all assignments in to Mrs. Sarkissian, or skip some of the steps upon talking to Mrs. Sarkissian and ensuring that there is a parent/teacher grading and coaching the student in the project instead.

9. All students will sign an agreement in which they agree to abide by the Intel ISEF guidelines as much as possible and bring glory to God in their project. They will also obtain permission from Mrs. Sarkissian and their parents for their topic of research to ensure that guidelines are being observed, to avoid "repeat" projects and to make sure that the topic and research is adequate and "do-able" for the grade level and means of the student.

The research paper guidelines:

Heading/Title – This should not be a separate page, but be the heading for the report. It should include the title, student name, date(s) experiment was performed.

Introduction/Purpose – Students should introduce and state the purpose of the experiment in one or two sentences. Some will be hypothesis driven and others will be discovery-driven. In either case the purpose regarding the goal of either the hypothesis or the exploratory process should be given as specifically as possible.

Background (history and theory –what we already know, overview, hypothesis) – Here students should discuss the theory and history behind this experiment and the kind of experiments. Here you explain some of the terms and the procedure and the reasons why a particular procedure is being used. Students should discuss research and what they already know about the process and techniques being used in the experiment. The information given here should result in the hypothesis (the reasoning behind the hypothesis) and the expectation for discovery.

Limited biographical information of those who historically ventured in the same field in the past is appropriate, but these mentions should be succinct and to the point. Tenth, 11th and 12th graders should provide a minimum of 4 outside sources. One of the sources should come from a non-electronic source.

Experimental Procedure/Method – Students should begin this section with a materials list, followed by a detailed description of what the student "did." Students should not present data in this section, but limit themselves to what they did and personal pronouns should generally be avoided.

Results – Data collected and observations made should be presented in this section, in labeled tables as much as possible. All trials and data should be presented even if students think some of it to be inaccurate and that it should be discarded. Numbers by themselves mean nothing in Science and must always be explained and contain units so that anyone reading the paper can understand what the data refers to. Interpreting and discussing the results should take place in the next section.

Discussion – Here students interpret the data and analyze and discuss the results. Students spell out what they learned, and judge the validity of the results, and whether the results were conclusive and/or confirmed the hypothesis or not. Students should also discuss percentage error and how accurate and/or precise the results are. If it is clear the experiment proved something different or opposite to the proposed hypothesis, this should be discussed as well.

Conclusion – Here students should critique the experiment and propose ideas for improving on it. Or perhaps discuss how to deal with variables that emerged during the experiment that interfered with the results. Students should suggest changes to the procedure including adding or changing materials that would improve the experiment.

References – Students should list all sources, including ideas found on the internet, in a bibliography using MLA format. A very useful help with listing journals and any other sources as well as a guide for "in-source" citations is https://owl.english.purdue.edu/owl/resource/747/05/.

This list was compiled by Mrs. Sarkissian and Mays, John. "The Student Lab Report Handbook: A Guide to Content, Style and Formatting for Effective Science Lab Reports." First Edition. Novare Science. 2006.

The display board guidelines:

Font type should be at least 16-point, not too small; the following are guidelines for what should be included. The abstract is required for Rhetoric Grade Levels. Pictures and graphs are recommended if they apply to the project. It should be informational, but also be attractive and easy to read and follow. Below is a sample display:

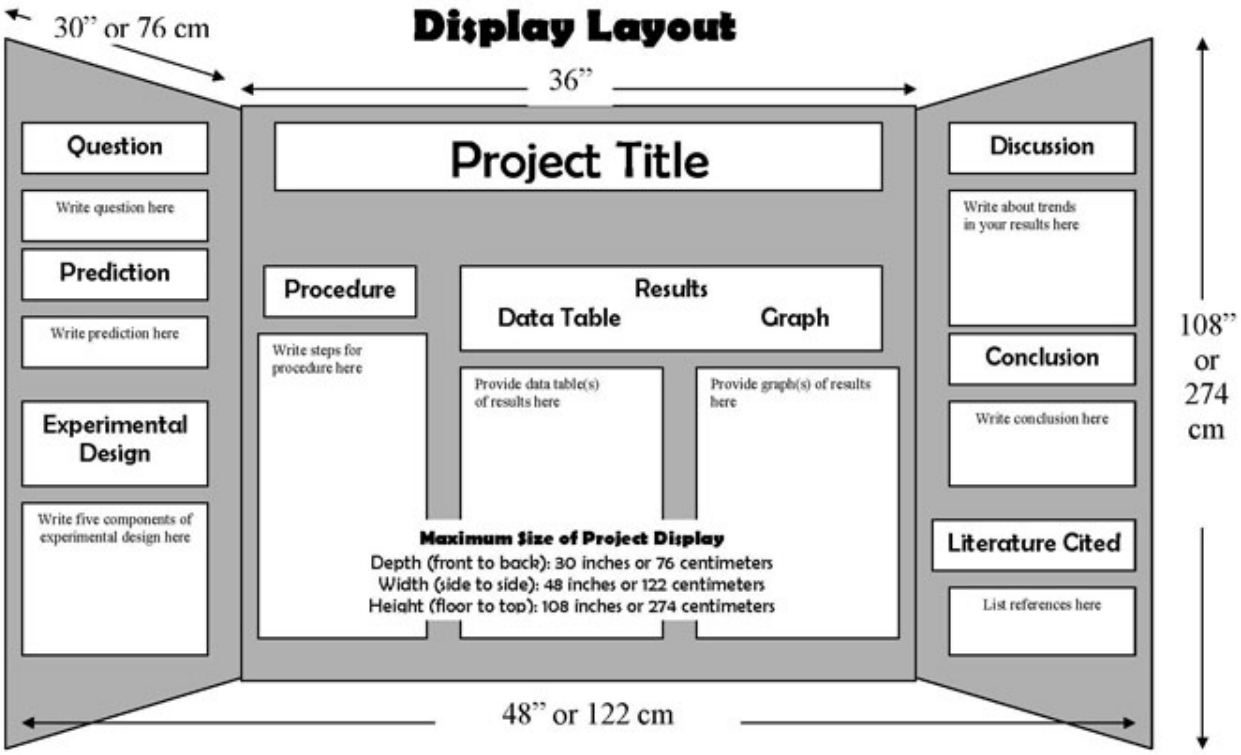

Image source - http://www.iconicdisplays.com/Science-Fair-Display-Guide.html

It is recommended that students also bring a portion of their experiment for display as would be appropriate (this will not work in all cases). They should also bring their lab journal that contains all the information and experimental notes so that students can refer to it if the judges have questions, and show their work (lab journal should always record dates, notes and adjustments).

Timeline

This year our Science Fair is scheduled for April 23, 2015. The upper grades at Geneva Academy have the following preliminary and final deadlines for students entering the Science Fair who do not attend Geneva full time.

DEADLINE	PROJECT/EVENT
12/15/2014	Preliminary deadline for application & project topic for approval {Mr. Turner/Mrs. Sarkissian}
01/31/2015	Final deadline for application & project topic for approval {Mr. Turner/Mrs. Sarkissian}
02/27/2015	Deadline for project outline approval {Mrs. Sarkissian}
03/25/2015	Research paper draft due
04/23/2015	SCIENCE FAIR

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