PRESEARCH

Analysis & Presentation

Basics of Scientific Research

Analysis

After getting the results of an experiment, the results must be analyzed to determine if they support the hypothesis or engineering goal.

A common way to do this is to use **different tests of statistical analysis**, however, only do this if it is actually possible, do not attempt to create additional results that should not be created, in other words "creating something from nothing," as this will likely produce data that has little relevance to the project.

If the data does not support the engineering goal or hypothesis, it should still be included unless there is an explanation for why it did not support the goal and the experiment needs to be repeated. Using this data from these tests and from the experiments of the project, the next reasonable step is to do three things.

First, identify the limitations of the project. This includes errors in testing, precision, possible unintentional variables, etc.

Second, create an idea for extension of the experiment. At every fair, to show dedication to the project, the presenter must show future investment. To do this, talk about the future of the project, but ensure that all the goals appear attainable. This is not required but does typically make a better impression on the judges.

The third step is to determine the applications of the project. The main application should be relatively easy to determine based on the background research that was done, however, the ability to demonstrate the versatility of a project can make the project seem more vital and therefore perform better at fairs. For additional information on data analysis, see the Stats review and the technical paper guide.

Presentation

Arguably the **most important part** of science fair is the presentation. There have been countless projects that have been shot down due to a bad presentation rather than bad quality. The presentation is generally made up of two parts, an oral and physical presentation.

Physical Presentation

For the physical presentation, the researcher should have at least one 36x48" trifold or flat board. However, I would personally recommend a board that is around 54x48" (1 and 1/2 board) if the project is more complex. The project board should have text that can be read by the judges without them needing to squint, additionally, the text should not be so big that it is obvious the researcher is looking to fill up space.

For highschool students, the board **should look professional**, meaning that if it is handmade, all cuts should be clean and uniform, otherwise, the board should be printed. If there is a key physical aspect to the project such as a device or final completed design, it is a good idea to bring it to the fair to further show the validity of the work.

However, there are guidelines of what a researcher can display, ensure that theses guidelines are met by all parts of the project. Some common guideline infractions include batteries, displaying personal information, and having a water container that has not been professionally clean.

Additionally, at the project, documents that have been vital to the project should be displayed, these documents include **journals, annotated bibliography, research plan, technical paper**, and any other required fair material including the **official abstract**.

Lastly, the researcher should be dressed in at least a button down shirt or suit with pants or a dress. Science fair is a **professional event so the researcher should look professional** when presenting their project.

Presentation

Oral Presentation

The oral part of the presentation is equally important as the physical part. For the district and regional fairs, each participant will likely be asked to present their project for **5-10 minutes**, however, some judges may be running behind, resulting in the presenter being given a shorter amount of time to present.

To prepare for this, the researcher should have speeches prepared that are **2 minutes ("elevator pitch"), 5 minutes, and 7 minutes**. The presentation should be in a conversational tone, ensuring that all information is communicated clearly. As participants advance to higher level fairs, the presentations **become less and less formal and more conversational**. In this case, the presenter's main presentation becomes their elevator pitch, leaving additional time for questions.

The best way to train a presentation and questions is to present to people from a variety of backgrounds. At local and regional fairs, participants are paired up with volunteers who may not have any experience in their field compared to the higher level fairs, this being said, it is important to practice presenting to people of a similar background to have a quick preview of the possible questions and problems that could arise from the presentation.

At higher level fairs, judges will likely have more experience in the field and ask more in depth questions. In this case, one way to prepare is to **do additional literature review to demonstrate your knowledge of the field** you were working in. Some important last things to note include to ensure you leave time for questions and attempt to develop a hook at the beginning of your presentation.

For examples of presentations, both physical and oral, you can see the Regeneron International Science Fair website in which many presenations are open to the public.