Natrona County School District Science Fair

Judge Handbook

The Value of a Science Fair Project

What makes a science fair project such a great learning experience is that it involves so much more than science? If the student is in middle school, the research report will most likely be the longest paper the student has ever written. The bibliography for the report will also be the first ever for some students. And, while library research is still important, these reports are a great way to hone computer research skills as well as learn the ins and outs of common office programs such as word processors and spreadsheets. Most projects involve a good deal of math, and all students get an opportunity to enhance their presentation skills when they prepare their display board and discuss the project with judges.

A science fair project will also have a longer duration than any other assignment a student has done. In contrast to the typical school homework due the next day or perhaps a week hence, a science fair project requires a student to learn to plan over two or three months, a skill of immense importance in adulthood. Procrastination is definitely not rewarded.

A science fair project provides an opportunity for the discussion of ethical issues such as plagiarism and falsification of data. Indeed, such a discussion is highly recommended. The ease of copying information from the Internet is hard to resist, and many students are far ahead of their teachers in understanding what is possible.

Our society relies more on science every day, and science fairs are a great way for students to become more knowledgeable about how the world around them works. Every citizen needs sufficient science literacy to make educated decisions about what they see or read in the media, about their own health care, and about other every-day problems.

Preparing a science fair project is an excellent example of what education experts call active learning or inquiry (also "hands-on" learning). It is a very effective instructional method; indeed, it is recommended as a cornerstone of successful science teaching. Yet, according to the National Research Council, active learning is not employed often enough in the classroom and its absence is seen as one of the key factors behind kids losing interest in science and not performing to their potential.

This is an excerpt from: The Value of A Science Fair Project found at: www.sciencebuddies.org

Scoring Rubric

Grade	Student #	Category							Project Name
Science Fair Rubric		Deficient		Adequate		Impressive		Total	
Procedures									Procedures
Original question		0	1	2	3	4	5		
Evidence of background reading (3 references)		0	1	2	3	4	5		
Purpose of project clearly stated		0	1	2	3	4	5		
Hypothesis stated in a way that can be tested		0	1	2	3	4	5		
Experiment designed to test each hypothesis		0	1	2	3	4	5		
Variables defined and controls used		0	1	2	3	4	5		
Complete and thorough methods		0	1	2	3	4	5		
Materials and Equipment									Materials and Equipment
Demonstrates knowledge about equipment		0	1	2	3	4	5		
Demonstrates skills necessary to do all the required work		0	1	2	3	4	5		
Appropriate materials and construction		0	1	2	3	4	5		
Data Collection and Interpretation									Data Collection and Interpretation
Student has collected measurable results		0	1	2	3	4	5		
Results verified (test done more than once)		0	1	2	3	4	5		
Collected data is organized: bgs, graphs etc		0	1	2	3	4	5		
Data clearly summarized		0	1	2	3	4	5		
Data reported in simplest terms		0	1	2	3	4	5		
Conclusion									Conclusion
Conclusion supported by data		0	1	2	3	4	5		
Conclusion relevant to hypothesis		0	1	2	3	4	5		
Complete and comprehensive report		0	1	2	3	4	5		
Attractive and interesting display		0	1	2	3	4	5		
Summary of what was learned		0	1	2	3	4	5		
Total of all the categories									
Scratch pad area									

Helpful Suggestions for Judges

Judging Information

Most fairs have similar point systems for judging a science fair project, but you may be better prepared by understanding that judges generally start by thinking that each student's project is average. Then, he or she adds or subtracts points from that. A student should receive more points for accomplishing the following:

1. Project Objectives
    * Presenting original ideas
    * Stating the problem clearly
    * Defining the variables and using controls
    * Relating background reading to the problem

2. Project Skills
    * Being knowledgeable about equipment used
    * Performing the experiments with little or no assistance except as required for safety
    * Demonstrating the skills required to obtain the data reported

3. Data Collection
    * Using a journal to collect data and research
    * Repeating the experiment to verify the results
    * Spending an appropriate amount of time to complete the project
    * Having measurable results

4. Data Interpretation
    * Using tables, graphs, and illustrations in interpreting data
    * Using research to interpret the data collected
    * Collecting enough data to draw a conclusion
    * Using only data collected to draw a conclusion

5. Project Presentation (Written Materials, Interviews, Displays)
    * Having a complete and comprehensive report (Junior Division)
    * Answering questions accurately
    * Using the display during the oral presentation
    * Justifying conclusions on the basis of experimental data
    * Summarizing what was learned
    * Presenting a display that shows creative ability and originality
    * Presenting an attractive and interesting display

Suggested Questions to Ask Presenters

- How did you get this idea?
- Is this project a continuation of an earlier year's project? If so, what did you add?
- What application does this project have to real life?
- Where was your project done?
- How is your project different from others that you researched?
- What was the most interesting background reading you did?
- How does this experiment conform to the scientific method?
- Which are your controls? Your variables? What is/are the difference(s) between your control and experimental groups(s)?
- Where did you get your animals (bacteria, plants, and so on)?
- Did you acquire any new skills while doing your project?
- What help did you receive from others (students, adults, teachers, family, and so on)?
- How did you determine your sample size?
- If you used any statistical tests, how did you choose them?
- Can you explain this graph to me?
- Can you explain your procedure to me?
- What does this (some project detail) mean?
- What do your results mean?
- How many times did you repeat this experiment (or test your device or program)?
- Did you need to change your original procedures? If so, why?
- Did you have any experimental errors in your project? If so, how did you correct for them?
- What is the most important thing you found out by doing this project?
- What changes can you make if you continue this project next year?