What is a Science Fair Project?

Generally, science fair projects are judged on two criteria: "scientific method" and "presentation". A student who has followed the scientific method will have a hypothesis, background information, materials / methods, results, and conclusions. This format should be followed regardless if the project is an experiment, innovation, or study.

- The most common type of projects fall into the *experimental category.* An example of this type is when a student may decide to study the effect of sunlight on plant growth (Here it is quite obvious how the manipulated or independent variable will effect some responding or dependent variable). Most people find this the easiest category to judge.
- *Innovations* include projects that duplicate or improve an existing technology, demonstrate a new use for existing technology, or create a new device or system. An example of an *innovation* project would include designing a new game and determining which game pieces would be most appropriate. Here the student may improvise a variety of products to determine which one is the best.
- In a study, the student may want to look at a question where they are unable to actually test their idea. For example, it may be as abstract as how long will it take the earth to be destroyed if it was hit by an asteroid, or does lung cancer affect men more than women. They should still formulate a hypothesis, such as Men are more likely than women to have cancer (perhaps because they have heard that more men smoke more than women or work in hazardous environments), and be able to produce observations that support/not support their hypothesis. In the study project, data is collected from published observations and used to formulate a conclusion.

Scientific Method:

1. **What is their question?** The student's question needs to be stated so that you can understand what they want to do. If their experiment does not answer their question - why is this so? Is the question worded badly or are they trying to say something else. What is their experimental design? Are the students missing key pieces to answer their question or does their design answer a different question. Often this implies a lack of understanding.

2. **Hypothesis.** I like to know why and how students pick their project. That will usually give you an idea of how they have developed their hypothesis. Some student pairs will have opposing views. In reality, most people develop a hypothesis after they have some results and then want to test a theory/hypothesis.

3. **Background information.** Is what they are providing relevant to their project? Do the have picture to help clarify an idea?

4. **Materials/methods.** This is the area that we again find students and judges have troubles. Students often are not sure what a 'control' is - that it is a treatment that we use to make comparisons before/after a treatment.

5. **Results.** Students need to show a summary of their work, usually in form of a bar graph, graph, or pie chart. Students should show averages of their results.

6. **Conclusions.** Perhaps the hardest for the students. Not only should the students be able to summarize what they have found and if it supports their hypothesis - they should also be able to tell you what societal implications their study can have.

Judging

Take a walk around the venue to look at some of the displays before you start interviewing the students.

Questions to consider asking students

1. What are you studying and why?
2. What is the basis of your hypothesis?
3. What are your controls?
4. Where are your observations?
5. What are you measuring?
6. Why should you have more than one replicate?
7. Did you take an average of your measurements?
8. How can this information be applied?
9. Did you have any problems with your project and how did you resolve them?
10. What is the most interesting thing you learned about your research topic?
11. Where did you get your resource material?
12. Did anyone help you with your project?
13. If you could do your project again, what would you change.

Questions to consider asking yourself:

1. Does their experimental design test their hypothesis?
2. Are there enough controls in their experiment?
3. Have they written out their procedure so that another person could follow it?
4. Do the observations make sense?
5. Have they correctly interpreted their results?