



Advice for Mentors and Judges

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The main purpose of a science fair is to encourage students do get involved in scientific inquiry or the design processes of technology. Mentors are parents or other adults who help and encourage the students as they carry out their inquiries and activities. Mentors do not teach, as much as they guide the discovery process in the student. Judges not only give marks and award prizes; they also give specific constructive suggestions and advice.

The first step, and sometimes the most difficult, that a student must take, is to find something that they wonder about. They can't discover something that they already know, or think they know. Once curiosity takes hold, the work can start.

The wonder and curiosity will point toward an emphasis on science or technology. Deciding on this direction is the first thing both judges and mentors must discern. The following quote, used *Pan Canadian Science Framework*, is taken from Larochelle, M. & Désautels, J (1992).

Science is a human and social activity with unique characteristics and a long history that has involved many men and women from many societies. Science is also a way of learning about the universe based on curiosity, creativity, imagination, intuition, exploration, observation, replication of experiments, interpretation of evidence, and debate over the evidence and its interpretations. Scientific activity provides a conceptual and theoretical base that is used in predicting, interpreting, and explaining natural and human-made phenomena. Many historians, sociologists, and philosophers of science argue that there is no set procedure for conducting a scientific investigation. Rather, they see science as driven by a combination of theories, knowledge, experimentation, and processes anchored in the physical world.

Technology, like science, is a creative human activity with a long history in all cultures of the world. Technology is concerned mainly with proposing solutions to problems arising from human adaptation to the environment. Since there are many possible solutions, there are inevitably many requirements, objectives, and constraints. Hence, the chief concern of technologists is to develop optimal solutions that represent a balance of costs and benefits to society, the economy, and the environment.

If the student's question involves how or why something happens, the answer is found by scientific inquiry. If, on the other hand, there is a specific problem to be solved or a process to be improved, then the design process of technology is involved. There will be some overlap between these two paths, as often when an attempt is made to design a new technological process, some inquiry into basic scientific principles must take place, or during the course of an inquiry, some original technology is used to gather

or analyze information. Usually the nature of the original purpose will determine whether the project is science or technology.

Once the basic purpose and direction is established, students should start a logbook. It should be in the form of a chronological journal. All information and the results of any experiments should be recorded. Sometimes the most valuable parts are the failed experiments or dead ends. The older the student, the more important the log book.

The next step is to look at Part A of the judging form that will be used. The one for the early grades has two columns, one for science and the other for technology. Chose one or the other and use the guide comments to judge the level of accomplishment. Mentors should encourage students to move to higher mark levels and judges will decide whether or not they have accomplished what they set out to do. The older students have three columns on their form. An experiment is the classic science inquiry process. An innovation is using the design process of technology to solve a problem or improve existing technology. The scientific inquiry can be done two ways. An experiment involves gathering original data by various means and analyzing it to come to one or more conclusions. A study involves taking existing data from a number of sources and applying analytical means to draw new conclusions or propose new theories. This last method allows older students to get involved in academic research.

The project divisions reflect this science and technology distinction. See the chart on the next page for a list of divisions.

As the project nears completion, thought must turn toward the display. Check the judging forms, the official rules and the student book for guidance on proper displays.

Parents, teachers and other adults that act as mentors or judges, must remember that their role is to encourage, give expert advice and guide, not to do the project. There is wide latitude for help, without cheating. The student must feel a sense of ownership of the work.

Enjoy the journey, and don't let the work overwhelm you. Never cease to wonder!

Project Classification

