

## Tips and Advice from ISEF Participants



### Pick Your Topic

Find a topic that interests you.

Explore the areas of your interest. Look for questions within that area that might be worth exploring. Along with interest, you should also choose a topic that can benefit your community or society in general. Look around your community and try to find something that you can discover, study, design, create or improve that will solve a troublesome problem. Why not choose a topic that will allow you to contribute to society and to make a difference? Don't be afraid to try something even though it might not work. Let your imagination run wild and be creative. Sometimes the simplest solutions and the smallest contributions are the most important. Read science magazines like *Science News* and *Scientific American* and research on the Internet to see what is currently being done in science. Always choose a topic that interests you and make sure whatever you choose is possible to do in time and with the equipment available. Read. Talk to people. You'll find out there's a lot of stuff out there you don't know that you would like to know by doing these things.

### Research Your Topic

Research what is already known about the topic. Narrow the topic to a specific scientific problem.

### Plan Your Experiments

Develop an experiment to solve the specific scientific problem you've chosen. See the Scientific Method to help plan your experiment.

### Consult Your Adult Sponsor

Discuss the project with your parents and teacher. Review with them the International Rules as well as the specific rules that might apply to your type of research. For example, if you are working with human subjects or animals or hazardous substances, specific rules apply. My experience with mentors has been fantastic. In addition to wonderful mentors who I found at my high school, I have been fortunate to work with researchers at several major scientific institutions. Finding these people was by no means easy, and I think that my success was probably due to persistence more than anything else. Even after I was rejected by administrators (who may view you as being too young), I continued to press my case until I was granted interviews with a few prospective mentors. Getting an interview is essential. The interview is when you and the mentor see if you are personally compatible. Ask your science teacher for help. Don't be shy—call professors at local universities or even E-mail them.

You should try to find someone to act as your mentor for support and suggestions. Nevertheless, it is not always required to work in a large institution with a specialist in your area of interest. I spent my time working at home in my father's workshop, using parts I found around the house to build my inventions and to solve a few problems. I also spent time working at school in the workshops and labs or out on the lake. A mentor is a guide, not a solution. Don't be afraid to seek help from several sources and to use the resources that are at your disposal.



### Write a Research Plan

- Write a detailed research plan describing how you plan to conduct your research:
- Develop a hypothesis using the Scientific Method.
- Develop a procedure.
- Obtain the appropriate approvals before starting your research.

### Complete the Required Forms

Complete the required forms for Intel ISEF and any additional local science fairs.

### Conduct Your Experiments

Begin your experimentation following your research plan and any revisions recommended by the people supervising or approving your research. Investigate to test the hypothesis. Make observations and collect data in a project journal (a project journal is required). Interpret the data and observations.

### Write the Abstract

Finalize your project for presentation. Write the abstract (required by Intel ISEF). If required for a local science fair, write a research paper.

### Prepare Your Presentation

See the Display and Safety Rules Information from Science Service Website Create the project exhibit board, being sure to follow the display and safety rules. Practice the presentation and prepare to answer the judge's questions. Present the project at your school science fair and/or at an Intel ISEF-affiliated fair. Your presentation board should be appealing to the eye and should explain both what you did and what you found. Pictures are very helpful and often say more than words. Diagrams are also very useful as they allow the public to follow your train of thought easily and without confusion. Avoid putting up your entire written report; try explaining your project visually with graphs,

diagrams, pictures and subtitles. Use color to separate ideas and arrows to direct your audience. Avoid buying expensive presentation tools. Your artistic touch is much more appreciated and shows your involvement in the project. Make sure your posters clearly outline what your project is about. You should be able to get what the project is, how it works, and how it was created from the posters. Have you display board look professional and not too crowded. Remember that large boards do not always indicate good projects. You will see a tremendous range of backboards at the Intel ISEF. Some will be equipped with remote controls, projection screens, fancy lights, or even personal power supplies. Some will look like they were assembled in an hour, because in many cases they were. Remember, people come to the Intel ISEF from all around the world, and sometimes they can't ship their completed backboards, and have to build them on-site. While it may seem that being in this position puts you at a serious disadvantage, don't worry. The reality is that the judges are keen enough to recognize good science, as long as it is presented reasonably well. The most important part of your presentation is verbal, and few judges will actually read most of your backboard. My advice is to not devote too much time to making your backboard look good, and to spend that time on your research.

### **Rehearse Your Presentation**

Do not memorize your presentation. I repeat, do not memorize your presentation. You should target your presentation to your audience every time, and this means changing it. To do this, of course, you have to know something about your audience. I suggest you use the first minute or two of your time to ask your judge about his background. You may learn, for example, that the last time your physics judge saw anything related to your project was in college, and that he's spent the last 30 years doing an entirely different kind of research. Or, you could find out that your military judge really wants to know if your project can help build a better computer (perhaps for nuclear weapons simulations, but not necessarily so). Relax. The judges are usually are friendly, and they aren't out to make mince meat of your project. Just tell them what it's about naturally, and answer their questions. Practice in front of a mirror and try to eliminate "ummm" from your speech. Don't spend too much time explaining your project so that the judge will have plenty of time to ask questions. Be confident in yourself. Look professional, smile, and relax. I've learned through experience and friends that the more enthusiastic you are about your project, the more excited the judges will be about it. Also, make your project appear wonderful, because in a lot of ways it probably is, but also remember the limitations of your project. Recognizing the limitations of data is a key to almost any scientific

pursuit. Rehearse, rehearse, rehearse. The best presentations are made by the groups most comfortable doing them. Anticipate questions that might be asked. Be prepared. The oral presentation is also very important. Make sure you speak clearly and that you take the time to ask your audience if they have any questions. It is important to cover everything briefly, even your failed attempts, and to do so in a logical pattern. Don't spend too much time on one thing. If you are working with a partner, take your turn explaining the project and switch every five minutes or so. This way, it allows your audience to differentiate between sections and will add energy to your presentation. Teamwork is essential. Work together and help each other out.

### **Enjoy the Experience!**

Don't participate in science fairs for the awards. Don't do science for the recognition. Don't compare yourself to anyone else and don't force yourself to do it. Do it because you love it and because you can make a difference. Help your community and contribute to society. Learn through your experiences and discover the world around you. Such is the true reward of science. Don't be afraid to try something even though it might not work. Things rarely work the first time. Learn from your mistakes, discover as you try different things, and never give up. Remember that science fair is supposed to be fun and don't let it stress you out too much and good luck to everyone!

\*Information from Science Service Website