Introduction

As discussed in the guide to Judging Tips for Top Science Fair Competitions, different top science competitions require participants to present their work in different formats. Some competitions rely heavily on display boards (for more details, see Big Display Boards for Top Science Competitions), others on PowerPoint presentations, and still others on written research papers. All of these formats require you to summarize what is likely a large body of research into a single, well thought out, striking, and informative presentation.

Figures Are the Key to Effective Data Presentation

Have you ever heard the saying "a picture is worth a thousand words"? This is certainly true when it comes to presenting data! Complex information, like experimental procedures and the resulting data, are usually best encapsulated using figures. This allows a judge, or any viewer, to quickly assess what you did, how much they understand, and what types of explanations or additional information they need from you. The kinds of figures you use to present your data will depend on the types of information you are conveying. There are four general types of figures.

- **Schematics, illustrations,** and **flow charts** are effective means of explaining how an experiment was conducted or the design concepts for an engineering project.
- **Tables** are a format for presenting raw data or statistical summaries of data in a well-organized manner. They are especially useful for conveying data where the details are important, or of keen interest, to your reviewers.
- **Graphs** are used to visually represent data. They are more striking than tables and are especially good at illustrating trends in data, quickly. However, graphs by themselves do not usually have the level of detail that a data table does. If you have data points or statistical information that is critical to reviewers, make sure to highlight them directly on the graph.
- **Photographs** are particularly useful for depicting an experimental setup, or examples of what results actually looked like. For example, if you were working on a project about the effects of a particular treatment on muscle cells, you might show actual photographs of the treated and untreated muscle tissues, as seen under a microscope.

Adhering to Data Presentation Standards in Your Field

In top science fair competitions, your work will be judged by scientists and engineers who are familiar with your field of research. As professionals, these judges have an expectation that what you present will be both rigorously analyzed and conform to standards in the field.

How do you find out what the standards are in your field of research? The most effective way is to refer back to the scientific articles that were most helpful in completing your research project. Pay particular attention to the ones that present data sets that are similar in makeup to your own data. Are there graphs? What kind? Line graphs or bar charts? What kind of statistical tests are depicted. If they use schematics, like circuit diagrams or genetic pedigrees, note the commonalities between articles in regards to how they represent certain constructs.

Make a list of the journals after which you're styling your graphs, tables, and other figures. Using a search engine like Google, Yahoo, or Bing find the online homepage of the journals, and read their style guides. **Style guides** (also called *author guidelines, information for authors,* or other similar terms), are detailed descriptions of how text and figures should look in a specific journal. To get you started, the table below contains direct links to the style guides of major journals and organizations from several different areas of science.

Journal or Organization	Area(s) of Science	Style Guide Link
Nature	All	www.nature.com/nature/authors/gta/index.html#a1
Proceedings of the National Academy of Sciences (PNAS)	All	www.pnas.org/site/misc/iforc.shtml
Science	All	www.sciencemag.org/about/authors/prep/index.dtl
American Psychological Association	Behavioral & Social Sciences	www.apastyle.org/manual/index.aspx
Journal of the Geological Society	Earth & Environmental Sciences	www.geolsoc.org.uk/gsl/op/prev%3C/publications/journals/jgs/jgs_authorinfo
American Society of Civil Engineers (ACME)	Engineering	pubs.asce.org/authors/journal/
Institute of Electrical and Electronics Engineering (IEEE)	Engineering	www.ieee.org/portal/cms_docs_iportals/iportals/publications/authors/transjnl/stylemanual.pdf
Cell	Life Sciences	www.cell.com/authors
Journal of the American Chemical Society (JACS)	Physical Sciences	pubs.acs.org/page/jacsat/submission/authors.html
Physical Review Letters	Physical Sciences	prl.aps.org/info/authors.html

Each style guide includes information about a multitude of details, including how to abbreviate technical terms, label figures, and overlay statistics on graphs. Choose the style guide most relevant to your project and follow it—this will give your data a polished and professional look.

Soliciting and Incorporating Feedback

Like the other components of your research project, creating an effective presentation is a learned skill. When you've finished putting together your presentation, it's a good idea to have your mentor, or another professional in your field of study, critique it. He or she may notice errors or have suggestions for more optimal ways of presenting your findings. By soliciting and incorporating feedback, you'll end up with a stronger final presentation.