How to Do a Science Fair Project

STEP 1: Doing the Research

Selecting a Topic: Try to keep it simple. Find a question you would like to answer. Students can find a topic by looking to favorite hobbies, sports, books, toys or family life for inspiration. You will put more time and energy into projects that interest you.
HINT: Here is a good link to help you decide on a topic http://www.sciencebuddies.com/science-fair-projects/recommender_register.php

Purpose and Hypothesis: The purpose is a description of what you plan to do and your hypothesis is an explanation of what you think will happen. One of the best ways to state your purpose is in the form of the question your experiment will try to answer. For example, "Does the type of salt affect the melting point of ice?" or "How does darkness affect the growth rate of various molds?"
HINT: Ask a few adults and see if they understand your purpose.

The hypothesis is what you think what will be the outcome of your experiment. For example, "I think potassium chloride will lower the melting point of ice more than sodium chloride" or "I think increased darkness will slow down the growth rate of mold". It is more important that your project be well designed than proving your hypothesis correct.

Background Research: Before you design your experiment, you should learn as much as possible about your topic. This will help you design a better experiment. Gather your information from books, magazines, pamphlets, newspapers, videos, television, people, and Internet searches. Start a logbook and be sure to write down all of your information sources. These will become your bibliography/references for your write up. After you have learned enough about your topic, talk to scientists and engineers who study your area of research. You can find these people at local companies, hospitals, colleges and universities and professional organizations. If you are not sure where to go, ask an adult or contact the CNYSEF director at cnysef@most.org.

Experiment: Now you have the background information that will help you design an experiment that will test the question you are trying to answer. You will need to record everything you do in your logbook even if there is no change in what you are testing. You want to make sure your experiment is only testing one thing and will provide you the answer to your question; this is very important. For example, if you are asking the question "Does the type of salt affect the melting point of ice?" you will need ice that is the same size, apply the same amount of your different salts to the ice at the same time. The temperature of the room, size of ice used, and amount of salt used are all the same, you are only changing one thing – the salt that you are using.

HINT: A good experiment also has a control condition where you do nothing. In the example above, your control condition would be another piece of ice that you do not apply salt to. This

control will tell you how quickly ice melts in the same environment as your experimental conditions. You can then compare your results to your control to see if there is a difference when you add salt.

Record all of your data in your logbook, the time and day you are doing your experiment, what you did, and what happened. In the above example you might want to measure your ice every 30 seconds to see how much it melted. Write all of this in your logbook – these are your results. If possible do your experiment a few times; this is what scientists call trials. Doing a few trials will allow you to make comparisons of your results to make sure they are consistent.

Results: All the data you have collected are your results. When you look at all your results you will be able to make conclusions about your experiment. Your results should be organized so others can see what happened. You may want to make a graph of your results.

Conclusions: Your conclusions are what your results mean and how your results compare with your hypothesis. If your results and your hypothesis don't match, you may want to discuss why. If your results gave you any ideas for future projects, you may want to discuss that as well.

STEP 2: Creating the Project

Your exhibit includes your display, a written abstract, and a written report.

An **abstract** is a summary of your project that is usually 1-2 paragraphs long. Judges like to collect abstracts so that they can remember more about your project as they are thinking about it after the judging period. You may want to bring 10 copies with you on fair day.

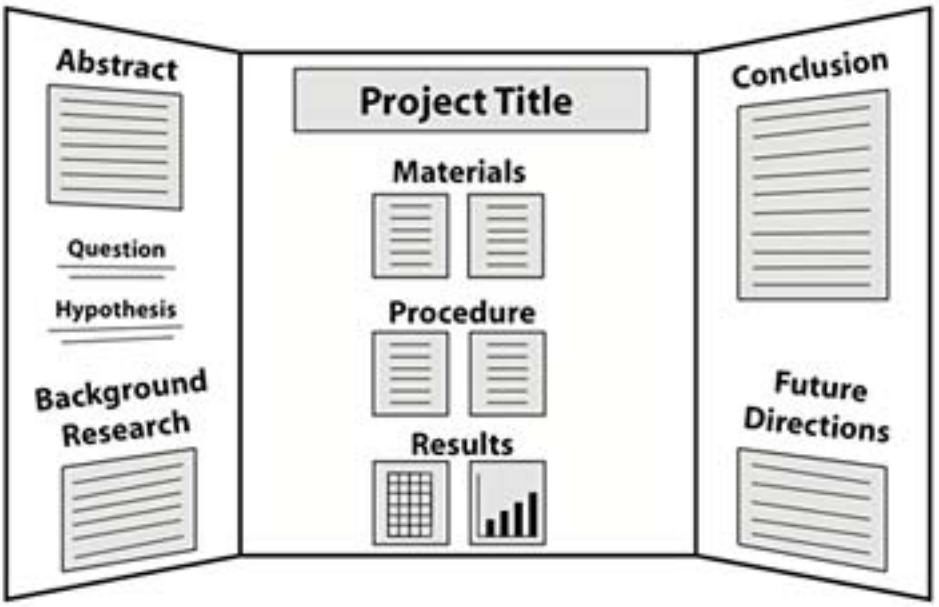
The **written report** can be one, or many pages and it can contain charts, graphs, illustrations and photographs. It should include these elements:

- The topic of your project
- Why it was chosen
- What you hoped to find out
- How you did the experiment
- How you reached your conclusion
- A bibliography of the research you did

Your **logbook**, as messy as it may be, should also be included since this is where you documented all your results as they happened.

You communicate your research visually through a **display**. A freestanding display board can be purchased inexpensively at most office supply stores. The students can use drawings, photographs, charts or anything else that describes their project visually.

This is what the display should look like:



Photographs of your project can be very useful. They can supply data and proof that your project existed, just in case it blows up the day before or the plants you fed special chemicals to decide to die or the project is too big for the space provided.
NOTE: ALL PHOTOS REQUIRE A PHOTO CREDIT LINE

STEP 3: Oral Presentation at the Fair

You should prepare 3-4 minute presentation about your project, including why you chose the topic, what the experiment entailed, and what you learned. It is a good idea to think of what questions judges may ask. This may help you feel more comfortable during the question phase of judging.

Judges want to know how the project was done and what you learned from it. EVEN IF YOU LEARNED THAT YOUR IDEA DIDN'T WORK, THE JUDGES REALIZE THAT LEARNING FROM SOMETHING THAT DIDN'T WORK IS JUST AS IMPORTANT AS LEARNING FROM SOMETHING THAT DID.

Presentations are not demonstrations. Judges want to hear your explanation of the experiment. You don’t need bring your experiment to the fair; a photo or two on your display board is sufficient. Additionally, CNYSEF does not provide electrical outlets to display tables.

HINT: Practicing your presentation in advance with adults you are comfortable with can help you improve your presentation. Judges will initiate a question-and-answer conversation. Feel free to

ask the judge to clarify any question you do not understand. Remember that a judge considers it more important that you learned something about your project than how flawlessly the experiment went.

For more tips, check out this website: http://sciencefair.math.iit.edu/presentation/