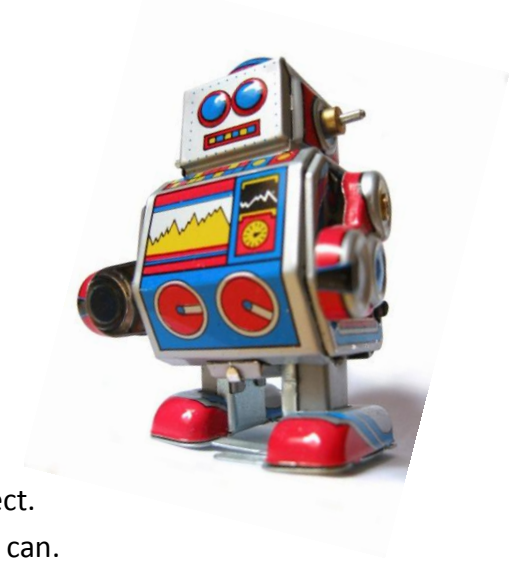
Science Fair Project

Some steps to help you organize your project . . .



Observation

What are you **interested** in; music, cooking, machines, books?

- Choose to do a project on a subject you are interested in.
- Read all the available (age-appropriate) material on your topic you can find.
- Seek help from librarians and local experts.
- Visit/contact a university and speak to professors or graduate students involved in your subject.
- Don't hesitate to ask people for help. If you are interested, most people will assist you if they can.
- It is very important to keep a complete bibliography of all material you find and a list of people who helped you.
- Begin keeping notes on your project in a notebook

Question

Choosing a question is one of the hardest parts of creating a Science Fair Project. Here are some guidelines:

- What topic interests you?
- What have you always wanted to know in that area?
- Choose a question that can be answered with a YES or a NO.
- Ask your teachers or parents for help when searching for ideas. What do you want to know?

- Narrow down your field of research. It is important to focus on one question. Rephrasing your question to expect a yes or no answer will help you see whether you have done this.
- Remember - the first requirement of a scientist is curiosity. If a world-class physicist can spend hours figuring out the way curve balls work and the speed at which they work best, don't assume any question you come up with is too lowly to investigate.
- Remember to keep track of your progress in your notebook.

The Hypothesis

What do you think may be the answer to your question? The hypothesis is the possible answer you will try to prove or disprove.

Examples:

- Are rocks classified according to hardness, color, density?
- Do pillbugs prefer moist surroundings?
- Are people's left and right feet the same size?
- Does the moon always rise at the same time?
- Do all fluids weigh the same?
- How much salt will dissolve in a cup of water- and what about sugar?
- How do matches work?

If you get this far and realize your question cannot be answered by the scientific method, return to step 2 and figure out whether any part of your question involves something which can be measured. If not, it is a question science can't answer. If yes, re-phrase your question accordingly and continue.

Method

Your method will be the process by which you prove or disprove your hypothesis. Make sure your method of investigation will answer your question and only your question. Compile a list of all the materials you will need to conduct your investigation. Keep track of costs. At this point begin doing your experiments, keeping very accurate records of everything you do. Record failures as well as successes. Keep track of all steps you perform and all tests you make in your notebook. If you can build or improvise your materials, so much the better. Where necessary, use a control as well.

Results

- Keep clear, precise records (need I add "in your notebook"?).
- Do your experiment again to check your results.
- Have you eliminated all variables (conditions which could affect your answer but for which you are not testing) ?
- **Do your experiment twice to ensure accuracy.**

Conclusion

You asked a question, you did an experiment, and you did the experiment a second time. You recorded your results. Now it is time to write your conclusion.

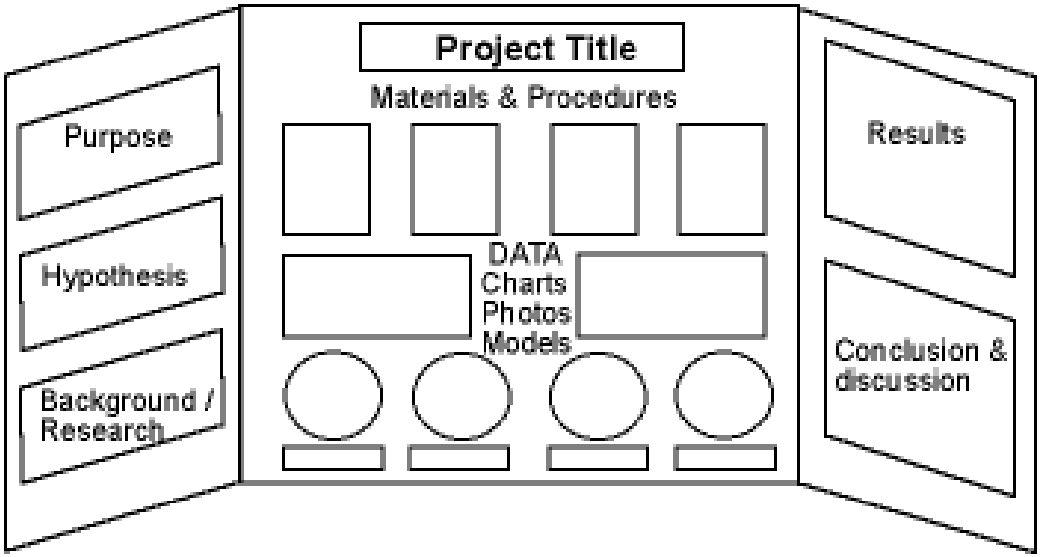
The conclusion, plain and simple, is the answer to your question. It should be clear, concise and stick to the point. Resist the temptation to jump to conclusions.

- If you were to do your experiment again, would you get the same results?
- Can there be differences? Why?
- Ask yourself what happened when you tested your hypothesis.

- What have you learned?
- Write a final report summarizing your question, research methods and conclusion.

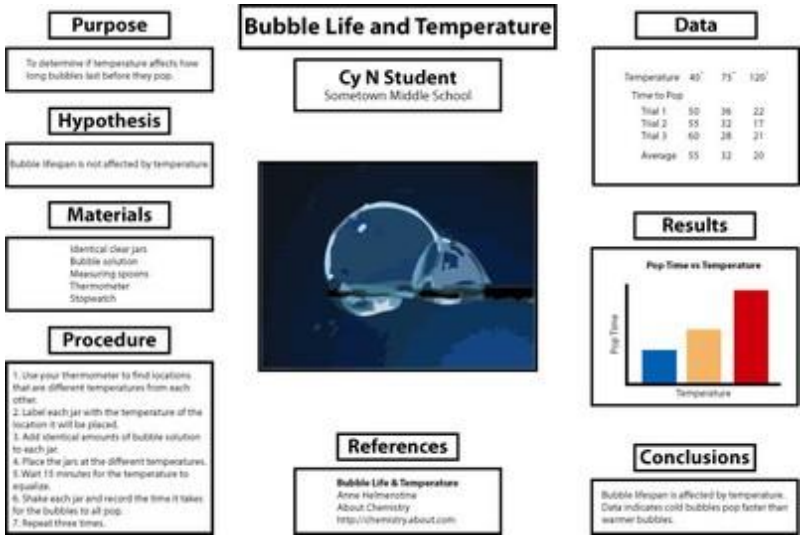
Presentation

- Prepare a POSTER or DISPLAY to give your audience a quick overview of the question you asked, the method you used, the result you got and the conclusion you came to.
- Draw charts, diagrams or illustrations to explain your question, methods and results.
- Standardized cardboard display boards can be purchased, or you can make your own.
- Your NOTEBOOK is an important part of your presentation- it will fill in the nitty- gritty details which would be too much for your audience to take in on the poster. Make sure it is complete and the information in it is clear. Display it with your poster for those who want to know more about your project than the bare bones.
- DEMONSTRATION MATERIALS which illustrate a scientific principle, equipment or materials used, or enable others to retrace your steps "hands-on" will make an exhibit more interesting and help others understand your discovery. Such materials should be placed in front of your backdrop display. If your experiment involves animals, dangerous chemicals or valuable equipment, take photographs to illustrate your work instead.



Here's an example of how you can organize a science fair project poster to clearly display your use of the scientific method for your project . . .

- **Title**: The title should be an accurate description of the project. The title is usually centered at the top of the poster.
- **Pictures:** Try to include color photographs of your project, samples from the project, tables, and graphs.
- **Introduction and Purpose**: Sometimes this section is called 'Background'. This section introduces the topic of the project, explains your interest in the project, and states the purpose of the project.
- **The Hypothesis or Question:** Explicitly state your hypothesis or question.
- **Materials and Methods**: List the materials you used in your project and describe the procedure that you used to perform the project. If you have a photo or diagram of your project, this is a good place to include it.
- **Data and Results**: Data and Results are not the same thing. Data refers to the actual numbers or other information you obtained in your project. Data is often presented in a table or graph. The Results section explains what the data means.
- **Conclusion**: The Conclusion focuses on the Hypothesis or Question as it compares to the Data and Results. What was the answer to the question? Was the hypothesis supported? What did you find out from the experiment?
- **References**: You may need to cite references or provide a bibliography for your project. Reference may be cited on the posted or printed out and placed below the poster.



For students including references with their project, the guide below may be useful . . .

APA Citation Quick Guide

When constructing a reference list or bibliography, arrange all entries in alphabetical order by the surname of the first author.

Book with a single author or editor

Arnheim, R. (1974). Art and visual perception: A psychology of the creative eye. (New version). Berkeley, CA: University of California Press.

Book with two to seven authors Use an ampersand (&) before the last author.

Festinger, L., Riecken, H. W., & Schachter, S. (1956). When prophecy fails. Minneapolis, MN: University of Minnesota Press.

Article or chapter in an edited book

Nelson, G., Lavoie, F., & Mitchell, T. (2007). The history and theories of community psychology in Canada. In S. M. Reich, M. Riemer, I. Prilleltensky, & M. Montero (Eds.), International community psychology: History and theories (pp. 13-36). New York, NY: Springer.

Electronic version of print book

Kappeler, P. M., & Silk, J. B. (Eds.). (2010). Mind the gap: Tracing the origins of human universals [SpringerLink version]. doi: 10.1007/978-3-642-02725-3

Web page

Autism Speaks Inc. (2005). Autism speaks. Retrieved from http://www.autismspeaks.org/index.php