

Science Fair Guide

This guide is designed for Junior and Senior High School students who have been assigned to do a science project.

By clicking on the links, you can find web sites that help explain science projects.

If you have any trouble locating items, or if you can't find what you need, ask a librarian. We'd be happy to help you!

The Scientific Method Anyone can conduct experiments. For instance you may want to discover why your dog runs away when you turn up the stereo. Maybe she doesn't like loud noises; maybe it's your taste of music. To find out, you could conduct a scientific experiment. In a scientific experiment everything must be measured precisely and accurately described. When going through these steps it's best to put everything down on paper in your project journal.

A scientific experiment uses five steps called the scientific method:

1. Identify the problem. Decide what your experiment is supposed to find out.
2. Research the problem. Think about the problem, read books, go online, talk to experts.
3. Formulate a hypothesis. Come up with an educated guess as to the outcome of the experiments, based on knowledge that you have obtained from your research.
4. Conduct an experiment. Your experiment is a series of tests built around your hypothesis.
5. Reach a conclusion. Based on the data you collect in your experiment, you will either prove or disprove your hypothesis.

Step One: Identifying the problem

You can think of a problem to which you have been curious, or just select a topic from books or websites.

Selecting a topic is often the most difficult part of a science project. Pick a project that interests you. If the project is interesting, you will work harder and enjoy it more. Don't be too ambitious. Oftentimes students fail to finish their project because they tried too hard. Try these web sites for ideas or look at the books available at the library.

1. [Science Fair Project Ideas](#)
2. [School Science Fairs](#)
3. [Science Fair Projects: Topics, Ideas, and Resources](#)
4. [Science Fair Central](#)
5. [Homeworkspot.com: Science Fair Center](#)
6. [Dragonfly TV's Science Fair Source](#)

Step Two: Researching the problem

To begin, you'll want to gather background information on the topic you've chosen. Search the library's catalog for books on your general subject (for example, "physics" or "botany"). You can also find good background information in general science encyclopedias. You can find many useful science sites online. A great place to start your research is in the [science section](#) of TeenWeb's homework help, or at the [Internet Public Library's Teenspace](#). After you have learned something about your subject of interest, you will be ready to define your hypothesis.

Step Three: Formulating a hypothesis

This is a critical stage in the scientific method because your experiment will entirely depend on having a workable hypothesis. A hypothesis should be stated in a form of a statement, such as "a leaf needs light to produce chlorophyll". Because you're just guessing, you could be correct, or you could be wrong. The point is to conduct the experiment and find out.

Step Four: Conduct an experiment

This is the real meat and potatoes of the scientific method. Conducting an experiment requires patience and precision. Before you begin, you will need to determine:

- What materials and equipment you'll need for the experiment
- How long the experiment will take
- Where you will conduct your experiment
- What procedures you'll use during the course of the project.
- What your controls and variables will be.
- If you need adult supervision for your project.

Throughout the course of the experiment, you'll need to take careful measurements and record your findings in your project journal. Try to collect more than one set of data to verify your results. Scientists always conduct many tests before they can safely come to a conclusion.

Step Five: Reach a conclusion

A project conclusion is a summary of your findings. You should compare your results to your hypothesis and either prove it or disprove it. Then state the possible reasons for the support or the difference between your hypothesis and your results.

Final Thoughts

After reading through this guide, you should have a good idea of what it takes to complete a science project. We suggest you look in some books available at your local library, or visit one of many helpful web sites. If you still have questions, be sure to ask your teacher or your librarian.

Selected Science Experiment Books

- Adams, Richard C. More ideas for science projects. 500 A216-1
- Bochinski, Julianne Blair. The complete handbook of science fair projects. 500 B664
- Bochinski, Julianne Blair. More award-winning science fair projects. 500 B664-1
- Churchill, E. Richard. 365 more simple science experiments with everyday materials. 500 C563
- Gardner, Robert. Robert Gardner's challenging science experiments. 500 G228-3
- Marty Berda and Mary Jean Blaisdell, eds. Science projects for all students. 500 S4165-18
- Rhatigan, Joe. Sure-to-win science fair projects. 500 R468
- VanCleave, Janice Pratt. Janice VanCleave's science experiment sourcebook. 372.5 V222
- VanCleave, Janice Pratt. Janice VanCleave's 202 oozing, bubbling, dripping, and bouncing experiments. 500 V222-1
- Vecchione, Glen. 100 award-winning science fair projects. 500 V398-1

Good Science Fair Web Sites

Super Science Fair Projects

Step-by-step guide to doing a science fair project including timeline, choosing a topic, scientific method, and an insight to how judges think.

IPL Science Fair Guide

Internet Public Library guides students through the steps necessary to create a successful science fair presentation.

Discovery Channel: Science Fair Central

Separate science fair guides for students, teachers, and parents. In the Science Fair Studio, there is a handbook for kids to help with the project, some project ideas and questions you can ask, and a list of books you can get at the library.

The Ultimate Science Fair Resource

Includes ideas for projects, step-by-step project instructions, links to other resources, and a board where students can exchange ideas.

Bunsen Bob's Science Hunt

Guide to picking, planning, and displaying a science project, as well as links to additional resources.

California State Science Fair

The California State Science Fair is the final science fair of the academic year for students throughout California in grades 6-12.

Energy Quest

California Energy Commission's energy and environmental education site for students, parents and teachers. Materials for students from kindergarten through high school. Games, puzzles, science projects on energy and other challenging information.