

Report

No matter what category you choose you will need to write a report. The report will be a complete summary of your experiment or the research you did for a project. Simply said you need to include in the report everything (people you talked to, results of your experiments, your purpose, the title, conclusion, anything you want us to know about your project) you did for the project.

Depending on what category you choose for your experiment, you may or may not need to use the scientific method. Look at what the category requires to see what needs to be done.

Categories

1. Experiments -- (example... the effects of junk food on a gerbil; mold growth on different types of bread)

The type of project most often presented at science fairs is the experiment. These presentations allow students to pose a problem, design an experiment to investigate the problem, record and report their results, and make conclusions based on those results. The final project is a display of the steps the student took in performing the experiment, the results of the experiment--successes or failures, and the conclusion based on the data results. Entries in this category will need to use the scientific method.

2. Demonstrations -- (Example... how birds fly; wavelengths of sound; how pianos work; all about fingerprints)

In this type of project students demonstrate a particular science principle or fact. The demonstration should be self-contained; that is, observers can operate or manipulate any controls, switches, or devices needed for the demonstration. Students may wish to demonstrate how something works, a science phenomenon, or how something is made naturally or in the lab. You must have a display telling us about your demonstration showing any pictures, charts, the title(s), and the purpose of your demonstration.

3. Research -- (Example...how matches work; how glass is made and used; tidal waves; diff types of explosives)

In a research project students investigate a chosen area of science by consulting primary sources. Students will need to consult reading materials from libraries, museums, government agencies, and the like. In addition they may choose to interview experts: scientists, health care workers, county agents, shop forepersons, and so on. It is encouraged that on-site investigation at labs, factories, a printing plant, a farm, or fish hatchery occur. The intent is for you to explore a scientific area in depth and detail and to report the findings in a vivid, interesting way through the project. You must have a display explaining your demonstration, showing any pictures, charts, titles, and the purpose of your demonstration.

4. Apparatus -- (Example -- thermometers, big and small; kinds of motors; windmills; simple machines; robots)

In this type of project students display some kind of scientific apparatus or instrument and describe their use or function in detail. The project should identify the importance of the apparatus for both scientists and the general public. Descriptions of how each apparatus is used within or outside the scientific community would also be appropriate.

HOW TO PREPARE A SCIENCE FAIR PROJECT

Getting The Info

Once you've identified your topic, the next step is to conduct your research. You want to collect as much information as possible. Begin by getting an overview of your topic. Encyclopedias contain general information about many topics and are a good starting point. However, they should be used only to get a general idea. Most libraries have a computerized system that allows you to type in a topic and then it searches its database to identify available books and magazines on the subject.

When you find a book on your topic, don't feel you have to read the whole thing. Look at the table of contents and the index for information related to your subject. Check the book's bibliography for other sources you may wish to review.

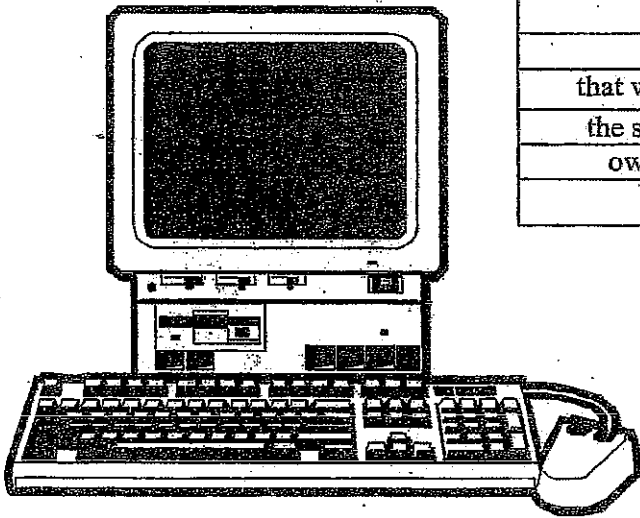
When collecting information from books and magazines, use index cards. Put only one idea on a card and be sure to include information for your bibliography. You'll need to list the title of the article, the name of the magazine or book, the author, the issue, the date, and the publisher.

The Internet can be an excellent resource of ideas and information. (Look at the Bibliography page in this booklet to see what information you will need when citing an Internet site).

Index Cards
can be very
helpful for
note taking.

<u>Title of Article, Name of Magazine, Author,</u>
<u>Issue, and Publisher</u>

Only one idea per card -
that will help you to avoid copying from
the source. You must put things in your
own words unless you use quotation
marks.



Name _____

Date _____

HOW TO PREPARE A SCIENCE FAIR PROJECT

A Controlled Experiment

To conduct a scientific investigation, care must be taken to follow experimental procedures. You must design an experiment to test your hypothesis. When planning your experiment, remember to keep everything the same except for the single variable being tested. A variable is something that can be changed in the experiment. It is what you are testing. Everything else must be the same and only one variable or condition is altered or changed. A control group should be used when conducting an experiment. This group receives the same attention as the test groups; however, it will not be influenced by the variable the other groups are testing.

Here is an example:

PURPOSE: How the amount of fertilizer used will affect plant growth.

HYPOTHESIS: Increased dosages of fertilizer will cause greater growth in tomato plants.

The test variable will be the amount of fertilizer used. So all other variables and conditions must stay the same. That means the following:

1. The seeds must all come from the same package and should be randomly selected.
2. All seeds must be planted in the same sized pots with similar soil.
3. All plants must receive exactly the same amount of water and light.
4. The temperature should be the same for all test plants.
5. More than one plant should be used in each test group.
6. Set one group as the **CONTROL GROUP**. This group is not given any fertilizer.
7. Set up two other test groups. One receives a certain amount of fertilizer each week. The other group receives twice as much.



Recording Observations and Data

Use a separate notebook to record all observations and measurements. Record information on a daily basis and consider the following:

- Make sure to use accurate measurements. For example: give mass in grams, volume in milliliters, and linear measurement in centimeters, etc.
- It is better to have too much data than not enough, so take a lot of notes.
- Write down the date and time of the observations.
- Consider taking photographs to be used in the report or display.

The Research Paper

It is important to share your research paper with others. One way to share information is in written form. The research paper should be typed with double spacing. Here are the parts that should be included in your paper:

1. **Title page** – should have your topic. Try not to put your name on your paper or anywhere on your project so as not to influence judging.
2. **Table of contents** – a brief outline of what is in your report.
3. **Purpose** – what you planned to do. It can be your hypothesis or what you hoped to learn by doing your project.
4. **Materials and/or methods of procedure** - describes what you used and step-by-step explanation of how you conducted your experiment. If you are not doing an experiment, tell what you learned by doing your research. Include drawings, photos, diagrams or anything else that may help someone understand what you did.
5. **Results** – the outcome of your experiment or the data you collected. You may want to include graphs, charts, tables, or daily logs to sum up what you found.
6. **Conclusion** – you interpret your findings. Did your findings match your hypothesis? Why do you think they did or didn't? Basically you want to answer your initial question about the project.
7. **Works cited (Bibliography)** – list the books, magazines, pamphlets, websites, or other communications you used in your research.

General Suggestions and Requirements

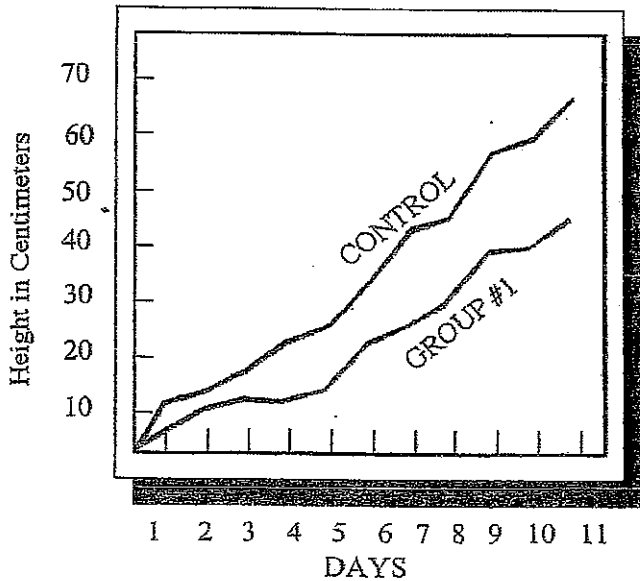
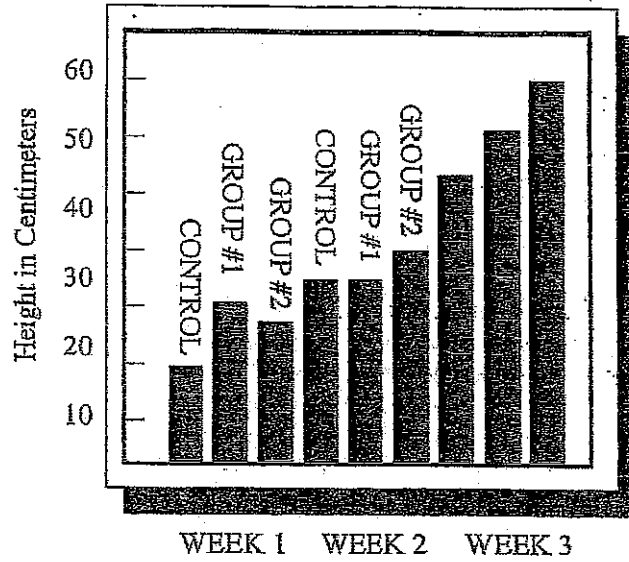
1. Make sure the question (with a question mark) is easily seen on your board.
2. All projects need a report and a display.
3. The report should be in more detail than what is on the board.
4. The report should be on the table, not attached to the board.
5. Try not to use tape or mixed mediums on projects. (Try not to make some things with markers and others with crayons or colored pencils.
6. Try to type everything. It almost always looks better than things that are hand-written.
7. Don't display anything that could be hazardous or dangerous. For example: use colored liquid instead of chemicals, use pictures or models instead of real mold or bacteria, have proper covers over electrical components, etc.
8. Make sure you indicate which category your project fits. Ask your science teacher for help if you need it.
9. You have an area of only one square meter in which to display your project.
10. It would be a good idea to use a judging form to judge your own project before it is actually judged at the fair. This will help you find problems before your project is judged.

HOW TO PREPARE A SCIENCE FAIR PROJECT

Graphs and Charts

Your daily log of observations will be the best means for sharing the data and information collected during the experiment. Charts and graphs will provide a fine way to share data in an easy to read and understand fashion. There are different kinds of charts and graphs. Here are some examples:

BAR GRAPH



LINE GRAPH

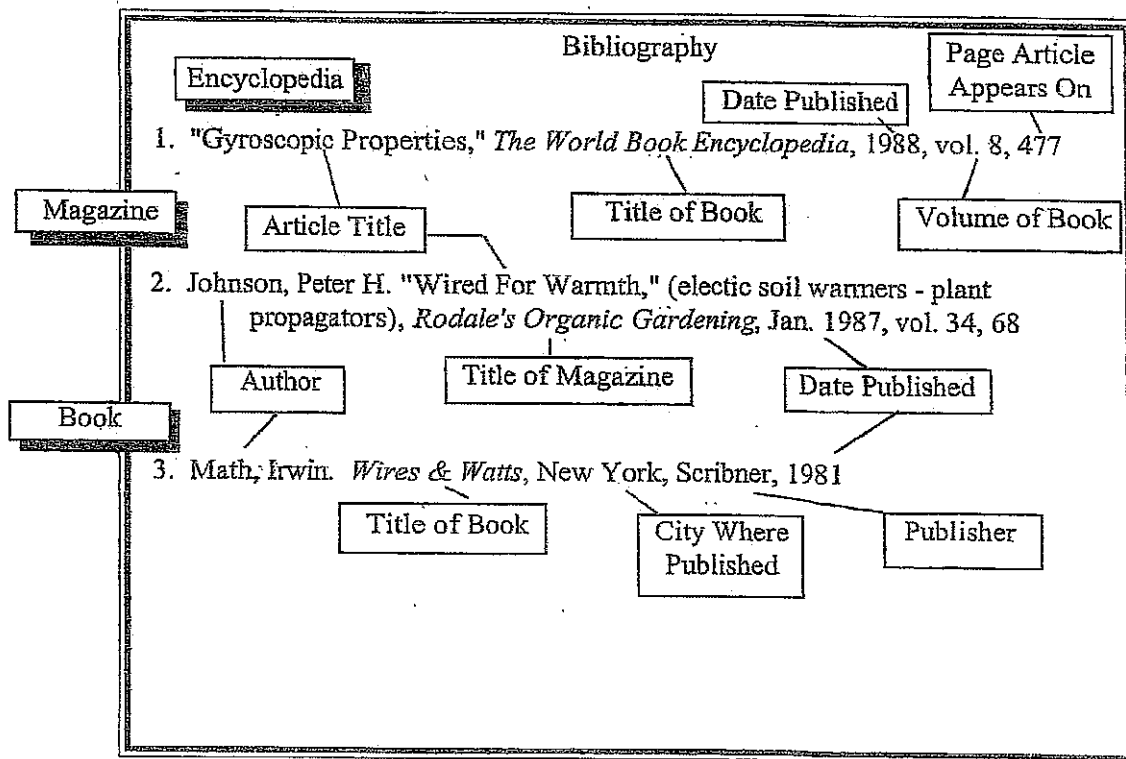
HOW TO PREPARE A SCIENCE FAIR PROJECT Developing a Bibliography

A bibliography is a listing of the resources and references used during the research of your project. It should include information about the magazines and books you used. That information is organized so that interested readers could seek out and find the books and articles you refer to.

In the case of a book, you must supply the title of the book, its author, publishing company, the city where the publishing company is located, and the date the book was published.

For a magazine article you must supply the title of the article, the author, the magazine it appeared in, the date of the magazine issue, the volume of the magazine, and the pages the article appeared on.

Here is an example of a bibliography:



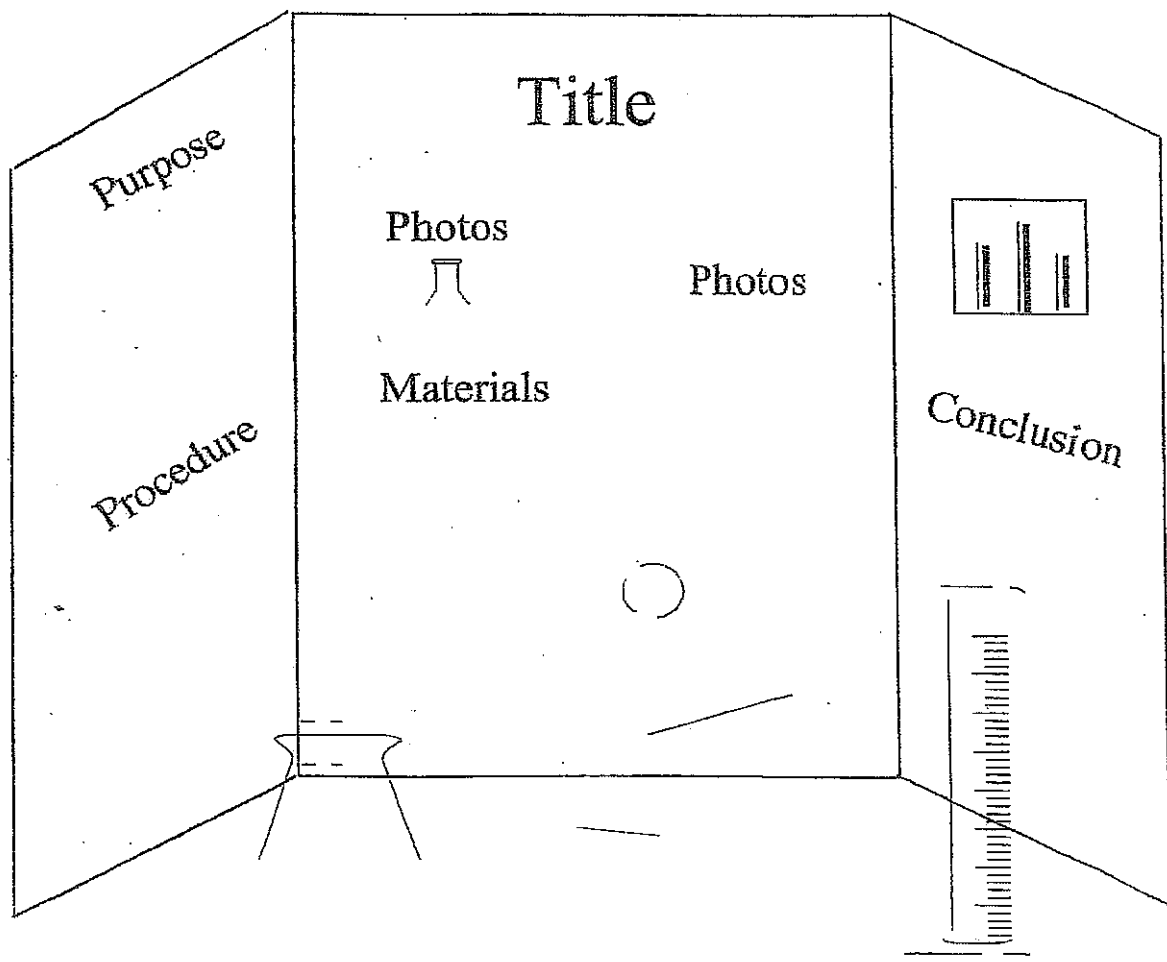
Name _____
Date _____

HOW TO PREPARE A SCIENCE FAIR PROJECT

The Exhibit or Display

This is a visual way to communicate to others so take your time and do a good job.

Be sure to check with your teacher or sponsor about the rules for dimensions of the exhibit. Most exhibits will have three sections and be expected to stand on their own. Displays are often placed on card tables so there will be limits to their size. Use sturdy material, such as plywood, masonite, or heavy cardboard, for the backboard. Use hinges or strong tape to hold the three sections together.



To make works cited (bibliography) entries for websites,

1. Make sure everything on the works cited page is double spaced.
2. If your entries go more than one line, indent the extra lines.
3. You can use "easybib.com" or "bibme.com" and it will make your works cited page for you.
4. For "easybib.com", find your specific article at the website, copy the address from the address bar and paste it into the address blank at "easybib.com". It should do the rest for you.
5. For "bibme.com", make sure you choose the MLA style. Then follow the prompts and it will complete your page for you.
6. If you are writing your works cited page yourself, put the name of the article in quotes (if you have one), italicize the general website, write the date you visited the site, and then write the address of the site with a "<" at the beginning and a ">" at the end. See the example below.

"Compare Diesels Side-by-Side." *Fuel Economy*. Wed. 04 Mar. 2010.

<<http://www.fueleconomy.gov/feg/diesel.shtml>>