

Doing The Project

1. **Literature Search: Internet, Library; Research what has been done and what is know about your subject, both in general and specifically.**
2. **Prepare a plan: detail what you want to do and how; METHODS; MATERIALS**
2. **Obtain approvals when needed: (SRC), See this section for specifics.**
3. **Discuss with teachers/parents and determine the number of trials/samples/datum points your project will require to make a significant outcome. Statistical analysis is important and will allow you to have a sound science project.**
4. **Perform your research and collect data. Keep a journal of all you have done.**
6. **Analyze Data, Prepare charts, graphs, photographs, etc.**
7. **Draw Conclusions and discuss limitations.**
8. **Prepare the Project Board: This is the organization of your research or engineering project into written communication. The project board will explain what you did, how you collected data, give representation of that data in graphical or other form, your conclusions. The information/material you put on that board must convey your entire project.**

Students and Teachers, Please Read

Scientific Review Committee (SRC)

It is absolutely imperative that all projects involving Human Subjects, Vertebrate Animals, Animal Tissues, Recombinant DNA, Pathogenic Organisms, or Controlled Substances **MUST obtain project approval by the SRC prior to starting the project.** Failure to obtain prior approval may result in disqualification from SARSEY and ISEF competition.

In the lower grades where the projects are not very complicated, teachers, parents, family friends will often say that is OK for a project to proceed, especially if the target is a family pet or if the human subjects happen to be family or friends. That is wrong and could result in disqualification. All such projects, no matter how innocent they may appear, must be submitted to the SRC committee, prior to starting the project, or they may not be qualified for SARSEF competition. For the lower grades we have created a special SRC form that is easy to complete and will be quickly reviewed.

Unacceptable for Display

The list on the back shows those items that cannot be displayed. Every year we have students bring materials that must be removed by the Display and Safety Committee, often causing tears and/or anger. Please review that list, and wherever possible, use drawings, graphics, and photographs on the display board. Also remember that we have several thousand students, teachers, and general public that come through the halls on Wednesday through Friday. If you decide to leave anything of value at the display, it is at your risk. We try, but it is difficult to police the over 1000 exhibits.

Abstract

Although it is not required at this level, starting, even in kindergarten, preparing an abstract is very good for the student's communications skills. In the 5th grade, an abstract is required before a student can be nominated to the DYSC competition. Having a parent or teacher help the student by editing is certainly OK, but the basic wording and communication must be the student's.

Steps in Preparing A Good Science Fair Project

1. **Selecting A Topic**

The first step in preparing a good science fair project is to select a topic for your project. Being the first 'hurdle' a student faces when starting a science fair project and they are often faced with quite a dilemma. Choosing a good project is very important because it can make the difference between a good and excellent project. First of all, you should pick a topic you are interested in. Secondly, it doesn't have to be complicated. Students often select complicated projects and then end up not fully understanding the concept or even giving up on the project.

2. **Research Your Topic**

After selecting your topic, learn everything about it. Books on your topic can likely be found in your local library or bookstore. The Internet may also be a good resource.

3. **Make A plan**

Once you consider yourself an 'expert' about your topic, make a plan as to how you will conduct your experiment. Your plan should include the following:

- The purpose or question for your experiment
- The hypothesis or what you think the outcome of the project will be
- The materials needed to complete your project
- A detailed procedure outlining how you will conduct the experiment

4. **Conduct The Experiment**

The next step is to follow the plan that you have written. While conducting the experiment, make sure you keep detailed notes on everything that you observe. You may even want to take pictures or make sketches of your observations. These notes are vital to your experiment because they are needed when you write your report and make your display.

5. **Analyze Your Results**

Once you are finished with the experiment, organize your notes. You may want to re-copy your notes so that they are more organized and can be easily understood by others. Then, analyze them. Ask yourself, what happened, did the results agree with your hypothesis, and so on. Make graphs and charts to represent the data to help you analyze it.

Project Hints

Here are some helpful hints that you might not consider when doing a science fair project:

Choose A Topic That Interests YOU

The topic that you choose for your science fair project should be one that is of interest to you. If you have ever tried to do something that did not interest you, chances are that you did not do your best. When participating in a science fair, to have a chance at winning you have to give it your all, or in other words – do your best. It is much easier to do your best when you are actually interested in the topic you are studying.

Do Your Own Work

When you are at the fair, and are asked to speak about your project, how can you talk about it if you didn't actually do it yourself? Getting help on a few specific aspects of your project is okay, there is nothing wrong with that, but it has to be YOU who completes the project, not a parent.

Give Yourself Plenty Of Time

For your project to be the best you can make it, you must allow yourself plenty of time to get it done. A good project can't be done the night before the fair or even a few days before. A good project requires weeks of planning and experimentation to be successful.

Your Project Doesn't Have To Be Complex

The purpose of a science fair is to help you (the student) to learn about a specific topic. Often times, students choose very difficult and tedious projects because they think that it will help them to do better at the fair. In theory, it is a good idea, but more often than not, the student becomes overwhelmed with the project and ends up not learning very much about it. It is better to pick a simpler project and be able to speak confidently on Science Fair Day than to choose a difficult one and be unsure.

Science Experiment Form

Student's Name(s) _____

Title of Experiment: _____

Question What do you want to find out?

Hypothesis What do you think you will find out?

Procedures How will you find out? (List step by step)

1. _____

2. _____

3. _____

4. _____

5. _____

(Continued on back)

Results What actually happened?

Conclusion _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

16. _____

17. _____

18. _____

19. _____

20. _____

(This is just a guide, you may more or you may have less steps)

Unacceptable for Display

These are the guidelines to help teachers, students, and parents be aware of some common problems associated with the SARSEF displays.

- Living organisms (e.g., plants, animals, and microbes).
- Dried plant materials.
- Taxidermy specimens or parts.
- Preserved vertebrate or invertebrate animals (includes embryos).
- Human or animal food.
- Human/animal parts (Exceptions: teeth, hair, nails, dried animal bones, histological dry mount sections, and wet mount tissue slides).
- Soil or waste samples.
- Chemical reagents including water.
- Poisons, drugs, controlled substances, hazardous substances or devices (i.e., firearms, weapons, and ammunition, reloading devices). Dry ice or other sublimating solids (i.e., solids which vaporize to a gas without passing through a liquid phase).
- Sharp items (i.e., syringes, needles, and pipettes).
- Flames or flammable materials.
- Empty tanks previously containing combustible liquids or gases, unless purged with carbon dioxide.
- Batteries with open top cells.
- Photographs or other visual presentations depicting vertebrate animals in other than normal conditions (i.e., surgical techniques, dissection, necropsies, or other lab techniques).
- Prior awards, medals, business cards, flags, etc.
- Personal photographs, accomplishments, acknowledgments, address, and phone and fax numbers, (photographs depicting the students performing a process is acceptable, but no portraits).

These Items are acceptable for display only (cannot be operated):

- Displays with unshielded belts, pulleys, and chains, and moving parts with tension or pinch points. Class II, III, and IV lasers.
- Any device requiring over 110 volts electrical power at the display.

Acceptable for Display and Operation by student only and during judging only (cannot be left at display during public viewing).

- Large vacuum tubes or dangerous ray-generating devices must be properly shielded.
- Electrical generated devices must be properly shielded.

Science Fair Topics

These are few of many topics you may want to do.

- What type of metal, steel, copper, or bronze will rust faster?
- What types of materials are stronger when they interact with acid rain?
- How sound affects plant growth?
- Strength of paper towels?
- Do beans grow better in clay, sand or potting soil?
- What household materials will put out fire the fastest?
- What type of water do plants grow best in?
- How does ultraviolet light react with different materials?
- Does the distance between the transmitters affect the volume of sound?
- Will different types of salt grow different kinds of crystals?
- What factors affect the growth of mold on bread?
- Does cold or heat affect how high a ball bounces?
- What type of soil resists erosion most effectively?
- What battery is the best deal in terms of price and the length of use?
- Which product waterproofs shoes the best?
- Which materials does a magnet go through better?
- Does the amount of air in a balloon, the color of the balloon, or the material the balloon is made of change the affect of heating or cooling the balloon?
- Does the location of a planted seed affect its growth?
- What kind of light do plants grow under best?
- What makes yeast react the best?
- Which material filters water the best?
- What liquid works best in making invisible ink?
- Does the wattage of the bulb affect the beam it produces?
- What carries the most static electricity?
- What type of water additive helps plants grow best?
- What type of salt melts ice faster?
- Does the color or amount of food coloring affect the speed of ice melting?
- Does artificial colored light make plants grow better than natural light?
- Which vegetables serve as the best conductors of electricity?
- What shape causes the most drag?
- Which brand of paint protects metal best against rust?
- Does the material of a parachute affect how fast it drops?

(Please check with your parents before you begin any of these experiments for advice and/or help)

Display Hints

The purpose of your display is to display your project to a judge. Content, or the information on the board is the most important thing. Many boards look good but don't have very much information. Your display board should look professional, something that a businessperson might use, not a little kid. It should attract the attention of a viewer and make them want to come over and read about your project.

It is good to use color in your display but you shouldn't make it too colorful because it will make your display lose its professionalism. Stick to one or two colors that contrast, such as black and white or red and green. Avoid fluorescent colors because they make your project look cheap. Whatever you do, don't use colors that clash. Use colors sparingly, you don't want the judges focusing on the colors instead of the content.

The title is very important in a display board. It should be eye-catching and easy to read. Be sure that the letters are large enough to read across a room. Use dark colors for the title.

Most display boards are of a 3-panel configuration and the traditional way to setup this type of board is:

Left Panel

Question
Hypothesis
Procedures

Center Panel

Title
Illustrations
Photos

Right Panel

Grafts
Results
Conclusions

Before you begin, make sure you plan out your board including making sketches. This can save you money if you mess up a board.

Be sure to put your name, teachers name, grade, and the school's name on the upper right hand corner of the center panel, in the back of display board. Do not put your name anywhere on the front.

Online Help and Resources

- Science Snacks
<http://www.exploratorium.edu/snacks/index.html>
- Experiments From The Exploratorium
http://www.exploratorium.edu/science_explorer/index.html
- Mad Scientist Experiments
<http://www.madsci.org/experiments/>
- Elementary Science Fair Projects Ideas and Topics
<http://www.science-ideas.com/elementary-projects.htm>
- Explore The Plant Kingdom
<http://web2.airmail.net/kboyle/Planlink.htm>
- In Search Of Green Life
<http://www.urbanext.uiuc.edu/gpe/case1/case1.html>
- The Great Plant Escape
<http://www.urbanext.uiuc.edu/gpe>
- Kids Gardening
<http://www.kidsgardening.org/>
- Science Fair Project Ideas
<http://www.science-ideas.com/projects-home.htm>
- Activities To Explore Static Electricity
<http://www.mos.org/sln/toe/staticmenu.html>
- Homework Spot – Science Fair Center
<http://www.homeworkspot.com/sciencefair/>
- Science Buddies
<http://www.sciencebuddies.org/>
- Science News For Kids
<http://www.sciencenewsforkids.org/articles/ScienceFairZone.asp>

Science Fair Judging Form

Project Title _____

INVESTIGATION – Is the problem stated and defined? Is there originality shown in the approach?

1 2 3 4 5 6 7 8 9 10

PROCEDURES – Is there a hypothesis? Are there logical scientific procedures?

1 2 3 4 5 6 7 8 9 10

RESULTS – Is supporting data displayed and summarized concise?

1 2 3 4 5 6 7 8 9 10

CONCLUSIONS – Are conclusions carefully interpreted and stated?

1 2 3 4 5 6 7 8 9 10

DISPLAY – Is information clear, organized, and neatly displayed?

1 2 3 4 5 6 7 8 9 10

ADDITIONAL COMMENTS:

TOTAL POINTS _____

Science Fair Project Entry Form

Student's Name: _____ Teacher: _____

Parent's Signature: _____ Subject: _____

Title: _____
(For example: Electricity, Biology, Solar Heat,
Physics, Nutrition, Energy, Chemistry,
Botany, etc...)

Type of Project: (Circle One)

Demonstration (Gathering information through research)

or

Experiment (Conducting an experiment following the scientific method)

Hypothesis: (For experiments only – What are you trying to prove? What do you think will happen?)

Individual Pair Group (List names of each below)
(Circle One)
