

HOW TO PREPARE A SCIENCE PROJECT

1. **Choosing A Subject:**

Deciding what to do may be the most difficult part. Start by listing subjects you are interested in. From each general subject area, list questions that you think might be interesting to answer. Finally, choose one that you think you can answer. Before choosing it, do some preliminary research and consider these three questions: Will it be interesting? Can I get the necessary equipment or materials to do it? Will I have enough time?

2. **Project Proposal:**

Once you have chosen your problem, write out your project proposal. In your proposal you will list your problem and the materials and procedures you plan to use. Submit your proposal to your teacher / advisor for approval before you begin. If you change problems, you must submit a new proposal!

3. **The Experiment:**

Once your proposal is approved, follow the time line given to you by your teacher.

a. **Research:**

- i. First, find out as much as you can about your topic. Look up information in science books and magazines or interview a scientist or specialist in the area you are studying.

b. **State your hypothesis:**

- i. This is sometimes called an "educated guess". What do you think you will discover once your experiment is finished? Your hypothesis does not have to be correct, rather you will be doing the experiment to test it and see if it was right.

c. **Begin your experiment:**

- i. Make measurements and record your data in metric units whenever possible.
- ii. Use a control when applicable.
- iii. Manage your variables properly. All external influences (controlled variables) must stay the same except the one (manipulated variable) you are testing.
- iv. Have a sufficiently large sample size or do your experiment more than once. If you do the same experiment ten times, will the results be similar?
- v. Collect and present your results. Tables, graphs and charts are helpful in evaluating data. You may have to do some statistical analysis to best evaluate your results (averages, means, modes, standard deviations, etc.).
- vi. From your results, form your conclusions. Was your original hypothesis correct? Should you do additional experiments to verify your results? Did "nothing happen"? This is sometimes called negative results. Negative results are acceptable. What you have found out is that in your experiment, the manipulated variable has no effect on the outcome. Remember that your results and your conclusions are a product of your experiment. Someone else may do the same experiment and get different results. You reduce this possibility by doing your experiment more than once.

4. **Making Your Display And Report:**

- a. Follow the display guidelines given by your teacher/advisor. Make your display look interesting and present all information clearly. Plan ahead to be sure that all lettering and segments will fit.
- b. If a written report is required, follow the guidelines presented by your teacher.
- c. Expensive or fragile items should not be displayed. Instead, use simulations, models or photographs. Items that are displayed should be adequately secured.
- d. Design your backboard for easy transport. Carefully pack all fragile materials before transporting them to and from the fair.
- e. Have a photo taken of you and your project for your scrapbook. Years later you'll be glad you did!