

# WV Science and Engineering Fair

## Steps to a Successful Project

The purpose of this guide is to provide information on how to complete a science fair project. Ideas are given on how to choose, develop, and display a project and how to prepare for judging. Although a lot of hard work goes into preparing a project, remember that the purpose of a project, which reflects you and your interests, is to provide you with an enjoyable learning experience, so above all, enjoy working and doing science because SCIENCE IS FUN!

### Steps to a successful project:

1. Understand the information in this guide and the fair rules: Before you start your project, familiarize yourself with the science fair rules, along with these suggestions.
2. Ask your teacher to explain anything you do not understand.
3. Pick your topic: Get an idea of what you want to explore! Choose a topic for your project that deals with an area of science that interests you. You can find ideas in books, magazines, textbooks etc. List the categories or ideas that you have selected and pick a specific topic.
4. Research your topic: Go to the library or internet and learn everything you can about your topic. Look for the unexplained or unexpected. Talk to professionals in the fields that you are interested in or email companies. Take notes on what you learn and keep track of the sources you use with a bibliography.
5. Organize: Organize everything you have learned about your topic. Next, create a question and hypothesis based on the information you have learned.
6. Plan your experiment: Once you have a project idea you must design an experiment. Next create a plan in which you list all the materials and steps in your experiment. Design an experiment that can be done in the amount of time that you have. Discuss this with your teacher to make sure that you are on the right track.
7. Complete your "paperwork": Use a calendar to identify important dates. Leave time to fill out your forms and review with your teacher.
8. Conduct your experiment and take photographs: During experimentation take detailed notes on what you see and do. Keep a research journal, including dates and times as needed. Take photographs, not including faces, of your experiment and the results. Make sure to change only one variable at a time in your experiment and start with a control experiment where nothing is changed. Make sure you include at least 5 or more test subjects in the control and experimental groups. Note any changes you made in your results.
9. Examine your results: When you complete your experiments, examine and record your findings. Use a chart, graph, table, etc. to record your results. Did your experiment go as you planned? Why or why not? Was your experiment performed with the exact same steps each time? Remember, gaining the understanding of unusual or unexpected results is not a scientific failure, but an important lesson to learn.
10. Draw conclusions: Answer the following conclusions: Which variables are important? Did you collect enough data? Do you need to conduct more experimentation? Did the results support your hypothesis? If your results did not, what happened? Remember an experiment is done to prove or disprove a hypothesis.

11. Prepare a report (optional for elementary and middle school, required for high school): Prepare a report on what you learned and how you learned it. First start with a rough draft, going into as much detail as possible so another person could repeat your experiment. A good report will include 1) a title, 2) acknowledgments of who helped, 3) an introduction of your topic, 4) discussion of your problem, 5) list of all materials, 6) your step by step procedure, 7) observation and results, 8) conclusions, and 9) bibliography.
12. Design your display: Now that your research and scientific report is done, you must now create a display to show what you have done. Neatness, clarity, and organization are keys to a successful display. Check spelling, punctuation, grammar, and the accuracy of your information. Your display may include whatever objects that are not excluded by the rules. Your display should include title, question, hypothesis, report, list of materials, procedure, observations, conclusions, and abstract. Refer to the back of this booklet for the list of items that may NOT be included in your display and an illustration of a display. Decisions regarding the format of projects are made by each individual fair.
13. Write your abstract (required): Using the required form, write an abstract. Include a clean copy of the abstract with your display. You will also need to submit your abstract when your project passes from the school to county to regional to state fairs.
14. Prepare for judging: Your project will be judged using a point system based on your science, your display, and your oral presentation. The oral presentation is an important part of the judging process. During your presentation, you should discuss:
  - why you chose your topic,
  - how you gathered your information,
  - how you tested your hypothesis,
  - what observations you made,
  - and what conclusions you reached.
15. You may want to write note cards or refer to parts of your display to plan what you are going to talk about. Rehearse what you are going to say, DO NOT READ your presentation. The presentation should only take 3-5 minutes. Practice in front of your family and friends. Keep in mind the judges are looking for a student who has learned from their research and experiment. Although it is natural to be a little nervous about presenting, remember that the judges are not there to trick or embarrass you. They are interested in you and what your project is all about, so be pleasant, courteous and enjoy yourself. Above all, show them that you are proud of what you have accomplished!