

The Complete Workbook for Science Fair Projects

Julianne Blair Bochinski



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Published by John Wiley & Sons, Inc., Hoboken, New Jersey
Published simultaneously in Canada.

Design and production by Navta Associates, Inc.

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ISBN 0-471-27336-8

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

In memory of the grandparents I remember, Peter and Petronella Fallis,
and the grandparents I wish I could have known, John and Ann Bochinski.

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ACKNOWLEDGMENTS

Once again, many thanks are due Science Service, Inc., for their advice and permission to reprint the official forms used for application to the Intel International Science and Engineering Fair. Thank you to Sister Mary Christine, assistant fair director and member of the board of directors of the Connecticut Science Fair. She is a former high school math department chairperson who has given many hours of her time mentoring and preparing students for science fair participation and competition for over thirty years, and I thank her for her insightful ideas and continued support of my books over the years. Acknowledgment is also due the Massachusetts State Science and Engineering Fair for their hospitality and good sense of humor in allowing me to stay to photograph and chat with their student contestants and judges after I caused them undue alarm with my clueless breach of security. I applaud you for your well organized event, dedicated committee members, and participants. Thanks for your kindness.

A very special thank you to the creative and talented student consultants who graciously provided their own personal stories for the case studies, namely: Christopher Waluk, Richard Grajewski, Brandon Habin, Colleen Muldoon, Sheela Chandrasheeker, and Lohith Kini. Your stories were amazing and inspirational. Finally, many thanks to my editor, Kate Bradford, for this opportunity; to my proofreader and friend, Rohan Goodsir, for his ideas and feedback in helping me finalize this workbook; and to my dear father and mother, Edmund and Elizabeth Bochinski, for always keeping me focused and motivated on this and many other projects.

INTRODUCTION

Over the past few years, I have visited a number of state and regional science fairs along with the grand event itself, the Intel International Science and Engineering Fair. The purpose of these visits was to research the latest trends and developments in the ever-growing and exciting world of science fairs for a new edition of my books, *The Complete Handbook of Science Fair Projects* and *More Award-Winning Science Fair Projects*.

While interviewing students, parents, and teachers, I asked them what they would like to see written about in a new book(s) about science fair projects. The response I received was rather surprising. While I imagined the majority would request award-winning science fair project recipes (okay, a lot of you did), there were actually a great number of requests for a simple, interactive science fair workbook that could be passed out by teachers to students in the classroom when administering a science fair project assignment, or by homeschoolers when introducing their children to the process of finding and completing a science fair project from scratch. These requests and suggestions came from a great deal of interest in treating the science fair project assignment as a separate course of study or class that would start at the outset of the academic year with a workbook of lessons, exercises, activities, and pages for students to take notes and write down ideas to help them through the assignment. Armed with those requests and ideas, I designed this easy-to-use interactive workbook that will take a student through the entire process of finding, completing, and submitting an award-winning science fair project of his or her very own. The workbook approach should help students make it to the top at their local science fair and get more out of the science fair process as a whole, rather than treat it as a burdensome homework project.

If you are brand new to the world of science fair projects or have a little experience and are ready to move forward with an interesting and exciting project, then this workbook is for you. Unlike science fair project “cookbooks” that offer you a selection of ready-made science fair project experiments to sample, this is an idea-generator workbook that will make you think like a student scientist (it

really isn't painful at all!) and take you on your very own science fair project journey.

Through a series of fun and meaningful exercises, activities, and inspirational case studies, this interactive guide gives you the game plan of the steps and creative ways to find the right topic, formulate a meaningful hypothesis statement, focus on a project objective, develop an experimental plan, use statistics to analyze and present your data, write a project report, and get ready for oral presentation and judging. It takes you through all these stages of a science fair project in a short, methodical, and easy-to-use format that is suitable for any student in grades 5 through 12. A list of scientific supply companies, sample project journal worksheets, sample science fair project forms, and a notes section to record your thoughts and ideas are included in the appendixes.

For teachers and parents, here is a short interactive primer for your students and children to get them thinking on their own. You can choose the exercises and activities for them to work on or have them choose for themselves. For students, here is your coach with a game plan to help you through the entire science fair project process. Use it alone or in combination with the award-winning projects in *The Complete Handbook of Science Fair Projects* or *More Award-Winning Science Fair Projects* for more inspiration. Most importantly, use this book to focus on your personal interests and have fun with it! Today's world of science fairs and projects offers many exciting opportunities for achievement. I wish you great success.

1

SCIENCE FAIRS AND SCIENCE FAIR PROJECTS

THE GAME PLAN

To understand what a science project is and how it works. To understand what a science fair is and what happens at a science fair.

What Is a Science Fair Project?

A science fair project is different from any other type of project you work on at school. It is an independent educational activity that encompasses a variety of skills, many of which you have to teach yourself as you go along. A science fair project gives you hands-on experience and knowledge in your own independent field of study of a particular topic in science, math, or engineering. It is a challenging extracurricular assignment that allows you to use your own ideas to investigate a scientific problem or question that interests you according to a process called the **scientific method** (defined more fully in the box on the following page).

A science fair project is *not* a book report; a term paper; a history project; a collection; a demonstration of a well-known scientific fact, principle, or discovery made in the past; or a display of something in science or nature. Don't be confused by science projects that you may see in books or on the Internet that are designed specifically to demonstrate certain scientific principles. Those projects might provide instructions on how to build or construct various items, such as a windmill, a camera in a box, a battery, or an electromagnet or motor, or demonstrate how things like magnetism, air resistance or drag, or electrolysis work, and so on. Although those projects are wonderful to sample in your free time or as classroom projects, they are not the same as a science fair project. A true science fair project poses a specific scientific question, the subject of which is studied and tested in order to arrive at a credible answer or a better technique or final product. To give you an example, a science fair project usually presents a question, a problem, or a purpose in one of the following cause-and-effect formats:

What is the effect of A on B?

How does A affect B?

To demonstrate, just substitute A with one of the following terms: