

Ancient Science

*40 Time-Traveling, World-Exploring,
History-Making Activities for Kids*

Jim Wiese

Illustrations by Ed Shems



John Wiley & Sons, Inc.

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For all the parents and
teachers who help make
science come alive

This book is printed on acid-free paper. ∞

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Acknowledgments

When I went to George Washington High School in Denver, Colorado, I had the chance to fulfill my high school history requirements by taking a class called Ancient History. I was fascinated by the stories my teacher told me of the beginning of human history. I learned about past civilizations that gave us democracy, great cities, and many scientific achievements. Ancient civilizations also built monuments, explored new worlds, and gave us great leaders. I learned that what and who we are today is the result of a process that began thousands of years ago. It was that thought that started this book. The purpose of this book is to show how different civilizations contributed to the world we live in today, to show the connections between history and science. Through the activities and stories, I hope you, too, will see how these subjects are linked and appreciate the influence each has on the other.

Again, I would like to thank the team of people at John Wiley & Sons who worked to make this book a reality. I would especially like to acknowledge the support and work of my editor, Kate Bradford. Her professionalism in every aspect of the publishing process continues to bring out the best in my writing.

Introduction

Have you ever wondered where paper came from? Or who made the first clock? Or who invented the compass or the magnifying glass? If you've ever asked yourself questions like these but don't know where to begin to find the answers, *Ancient Science* is the place to start. Science ideas have come from all over the world and from many different civilizations and cultures. Advances in science and technology have helped shape human history since ancient humans first learned to use tools, plant crops, and study the heavens.

Ancient Science lets you investigate some of the greatest scientific discoveries and the people who first introduced them to the world, from Egyptian clocks, Greek lighthouses, and Roman bridges to Chinese kites and Mesopotamian soap. So get ready for 40 exciting activities that will let you learn more about the people and cultures that helped make so many modern things (including books!) possible.

How to Use This Book

Every ancient civilization contributed something to science, so this book is divided into chapters based on civilization, including Egyptian, Roman, Greek, Mayan and Aztec, Chinese, Middle Eastern, and others. In each chapter there are groups of projects that teach you about some of the scientific contributions of each culture. Each project has a list of materials and a procedure to follow. You'll be able to find most of the materials needed around the house or at your neighborhood hardware or grocery store.

Some of the projects have a section called More Fun Stuff to Do that lets you try different variations on the original activity. Explanations are given at the end of each project. Words in **bold** type are defined in the glossary at the back of the book.

Being a Good Scientist



Read through the instructions once completely and collect all the equipment you'll need before you start the activity or experiment.

- ▲ Keep a notebook. Write down what you do in each experiment or project and what happens.
- ▲ Follow the instructions carefully. *Do not attempt to do by yourself any steps that require the help of an adult.*
- ▲ If your project does not work properly the first time, try again or try doing it in a slightly different way. Experiments don't always work perfectly the first time.
- ▲ Always have an open mind that asks questions and looks for answers. The basis of good science is asking good questions and finding the best answers.

Increasing Your Understanding

- ▲ Make small changes in the design of the equipment or project to see if the results stay the same. Change only one thing at a time so you can tell which change caused a particular result.
- ▲ Make up an experiment or activity to test your own ideas about how things work.
- ▲ Look at the world around you for examples of the scientific principles that you have learned.
- ▲ Don't worry if at first you don't understand how everything works. There will always be new things to discover. Remember that many of the most famous discoveries were made by accident.

Using This Book to Do a Science Fair Project

Many of the activities in this book can serve as the starting point for a science fair project. After doing the experiment as it is written in the book, what questions come to mind? Some possible projects are suggested in the section of the activities called More Fun Stuff to Do.

To begin your science fair project, first write down the problem you want to study and come up with a hypothesis. A **hypothesis** is an educated guess about the results of an experiment you are going to perform. For example, if you enjoyed doing the Pyramid Power activity, you may want to find out how other inclined planes work to complete a task. A hypothesis for this experiment could be that a longer inclined plane makes it easier to move the block up the ramp.

Next you will have to devise an experiment to test your hypothesis. In the Pyramid Power example, you might test several inclined planes of different lengths, then observe and record the results as the block moves up the ramp. Be sure to keep careful records of your experiment. Next analyze the data you recorded. In the Pyramid Power example, you could create a table showing the length of the inclined plane and the force necessary to move the block, and then you could graph the results. Finally, come up with a conclusion that shows how your results prove or disprove your hypothesis.

This process is called the **scientific method**. When following the scientific method, you begin with a hypothesis, test it with an experiment, analyze the results, and draw a conclusion.

A Word of Warning

Some science experiments can be dangerous. *Ask an adult to help you with experiments that call for adult help, such as those that involve matches, knives, or other dangerous materials.* Don't forget to ask your parents' permission to use household items, and put away your equipment and clean up your work area when you have finished experimenting. Good scientists are careful and avoid accidents.

1 SCIENCE FROM THE DAWN OF TIME

The First Humans

