

Science in the Kitchen

FEARLESS SCIENCE AT HOME FOR ALL AGES

Practical Inspirations

Practical Inspirations
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Introduction

Does the word “science” give you visions of black-topped tables, Bunsen burners, and lab coats? Or, maybe it’s the obnoxious odor from preserved frogs and long, rubbery worms? Do words like acid, chemical, and nuclear strike fear in your heart? Is physics something that is only done at a secret location in Nevada? We’ve even heard the tales of smoking basements and exploding garages — tales that curl the hair of even the most adventurous parent. (I know of one such tale that is true and the man is now an engineer for NASA.)

There is nothing magical about the traditional school science lab. In fact, more science is discovered outside the building. It’s said that Isaac Newton made his discovery sitting under an apple tree. Experiments were conducted on the moon. You’re about to find out that smelly frogs, black lab tables, and exploding basements are not the essentials of science learning. All it’s going to take is an inquisitive mind and an adventurous spirit.

If you have raised a child from birth to at least five years old, you have participated in more science than you ever thought possible. One of a baby’s first activities is to explore the world around him. That is science. Children are, also, natural questioners. The scientific method is nothing more than asking questions and looking for answers.

Often we have only myths, legends, and not-so-pleasant memories to go on. Or, we find science boring because it was taught to us in a fragmented way that had no real meaning in our lives. The science study that many of us are familiar with is nothing more than hunting for a correct answer. Teaching science at home, especially lab science, is feared because science seems foreign to us. This booklet is to help dismiss those fears by taking a look at what science really is and what science education can be.

Too often we view science as another subject to be taught straight from the book, following exacting instructions. Since science is about **DOING**, I emphasize **DOING** science through investigation, experimentation, and testing. By doing “labs” as the interest comes, required knowledge will be learned as part of the process. Science learning doesn’t exclude reading and researching. **DOING** science just puts it in a different order and perspective on the reading and research.

I have designed this book to be a guide as you teach the various science areas. You don’t have to sit and read the whole book before starting to teach. You should read chapters one and two to begin with, from there pick the area you plan to teach and use the chapters you need.

We need to also overcome the concern for learning gaps. No one knows everything. The same is true in science. It’s not possible to know everything about any branch of science. It’s not even desirable to try and teach every detail. Help your student discover the major concepts. She will go on from there to learn. Furthermore, it’s not shameful to admit when you don’t know something. In fact, our students learn from watching us learn.

Another goal of this booklet is to help you use what is at hand to teach science. No matter the area or grade level, it isn’t necessary to have a full scale laboratory and expensive equipment to show our students how to discover science principles. Part of the learning will come from “making do.”

Your success as a science teacher will be determined by first, by your attitude toward the various areas of science; and second, by your understanding of science ideas. My hope is that you and your students will gain a better understanding of the sciences. In the process, you will gain a better understand of the universe that God has created.

What is Science?

How you approach science will determine how your student learns. First, do away with the idea that you must *teach* it. Teaching implies telling. You then must have the facts to convey to the student. Not true. It is possible for your student to discover the scientific principles on his own.

You also need to develop your own understanding of what science is and what each branch of science is. I could give you a definition of science; it is best discovered on your own. Some of my discoveries are:

science - (L) to know - knowledge...the comprehension or understanding of truth or facts by the mind a collection of the general principles or leading truths relating to any subject .. built on self-evident truths

chemistry (chimistry) the science which investigates the composition of material substances

biology - the science which deals with the origin and life-history of plants and animals

physics - (Greek - natural) the science of nature or of natural objects, comprehending the study or knowledge of whatever exists

To make your own discoveries, along with your child, take the following steps.

- Define the word
- Paraphrase the definition
- Discover what the Bible say about the subject
- Write your own conclusions on your research.

Let's expand each of these. You may want to get a notebook and begin exploring these topics right now.

DEFINE THE WORD - For the truest definition of the word, use the Webster's 1828 American Dictionary. Not only do you want to find the definition, but also knowing the root origin of the word helps firm the meaning in your mind. Write out the portion of the definition that pertains to the topic you are studying.

PARAPHRASE THE DEFINITION - Put the definition in your own words. The meaning of the term will now become your own. It will make sense to you.

WHAT DOES THE BIBLE SAY ABOUT THE SUBJECT - God has something to say about everything. Using a concordance, Bible Dictionary, Topical Bible, you can find references that apply to what

you are studying. Granted, the word *biology* may not be found. The Bible is teeming with information about biological systems. Ruth Haycocks Bible Subjects is an outstanding resource.

WRITE YOUR OWN CONCLUSIONS - With the information that you have gathered, write everything that comes to your head about the subject. This may be a page or more long. You will now have a better understanding of what you are about to teach and can proceed with confidence.

The teacher and student should do this exercise together. Compare conclusions. Discuss differences. This is the foundation to begin your studies in science. I'm not including my conclusions because I want you to learn your own.

For every aspect of general science, you can use this method to define and get a handle on the subject matter. But, don't over do it. This should take no more than a day for elementary students. For your secondary students you may want them to write more in-depth papers. Don't let defining the subject take the fun out of the study.

Science, as you have just discovered, is not mysterious after all. You will be teaching your student valuable skills that will be used throughout life: observing, classifying, inferring, predicting, measuring, and interpreting data. In addition, they will learn to ask questions and find the answers, test their ideas, and communicate the facts they've learned.

This type of learning doesn't take place with mere reading of books, following a lesson plan, or answering questions at the end of the chapter. Science is about discovering and doing. Along the way, reading and researching will come into play. For the most part, it will be your student asking a question, coming up with an answer, testing the answer, and sharing it with others.

Another aspect of science that is often overlooked is failure. Thomas Edison didn't invent the light bulb on the first attempt. It took hundreds of trials and over a year of steady work before he even had moderate success. As students test their theories, they may find they've made a mistake. The hypothesis could be wrong, the method of testing could be wrong, the materials could be wrong. That's o.k. It's even o.k. if they follow a lab book and the experiment doesn't turn out the way the book says. Children need to learn that they can make mistakes without disapproval.

Science also teaches students to think not just accept information and regurgitate facts. When presented with a problem, the student must gather the facts, think through the information, and solve the problem with hypothesis and testing. Most discoveries have been made based on a problem to be solved. For example, medical break-throughs come when a doctor wants to solve the problem of curing a disease.

Students have a natural inclination toward science whether we realize it or not. There is the natural desire to experiment. This is seen when a baby puts things in his mouth or a toddler pours water from one container to another. Then, there's the lure of science equipment. This is grown-up stuff to most youngsters. When they are capable of using first a magnifying glass then a microscope, children are interested. And, there's the interest in taking things apart. What mother hasn't found her child in the middle of nuts and bolts from a bicycle or other toy?

Teaching science is important to knowing and understanding the world that God has created and why humans were created. Science is really nothing more than the study of God's creation. All science follows predictable patterns that can be traced back to the beginning of the universe when God said, "Let there be light."

Science can be and should be fun for teacher and student. The success of the Backyard Scientist, Jane Hoffman, has been her contagious fun-loving attitude. Get ready to enjoy yourself as you guide your student to discovering science.

Science in the Kitchen

FEARLESS SCIENCE AT HOME FOR ALL AGES

I attended Susan Stewart's workshops on teaching science at home. Her suggestions helped us triumph over high school science--especially those labs. I'm so excited to see that she's assembled this information to share with others. She convinced me that high school science was "doable."

Lesha Myers
Author, *Making the Grade* and *His California Story*

"From the backyard to the kitchen – Susan's book takes up where the Backyard Scientist series left off, debunking the myth that high school science courses require a home school family to invest in expensive laboratory equipment and supplies. Science in the Kitchen will make biology, chemistry and physics user-friendly no matter which curriculum is being used."

Sharon Grimes
Founder, LEAH, Inc., New York; Pastor's wife; and homeschool conference speaker

Lab science is experimenting, or playing around, with stuff to find out what happens. Science is something students do.

"Doing" science is the philosophy behind *Science in the Kitchen*. Susan K. Stewart helps eliminate science-phobia by showing how to use any curriculum at home, where to get science supplies, and take the mystery out of the big three: physics, biology, and chemistry. This unique approach will help you with

- Understanding what science is
- Using common household items
- Developing a science course
- Sample lesson plans
- Sample labs
- Resources for lab equipment & science studies

Susan K. Stewart is a teacher, writer, and speaker. Beginning in 1981, she taught her three children at home for 19 years and is considered a pioneer in the modern home education movement. Prior to that time, Susan taught in public and private schools. Susan's workshop, by the same name, has been a conference favorite since 1995.

