

## ***The Rainbow*** **Product Description**

*The Rainbow* is a two- year, laboratory-based science curriculum for home schooled children who are (nominally) in Junior High School (grades 7-9). It is sold with all the laboratory equipment and supplies included to make laboratory science safe and easily doable in a home environment. It is a textbook-driven curriculum so the students are exposed to the theory and principles as well as the laboratory practicum.

### **Where Am I?**

You know the feeling. You've just walked into a large shopping mall you have never visited before. You know what you came for, but you do not know the layout of the stores and you have a limited amount of time to find it. So what do you do? You go to the map of the mall and find your target destination. But that alone is not meaningful until...until you find that conspicuous red dot with the words emblazoned in bold. **YOU ARE HERE**. Now, with this basic information— starting point and destination—you can begin to chart your path and get there efficiently.

Now imagine that you are a junior high student. You know that science is big and *can be* somewhat forboding. What all is encompassed by this topic called science? And what are its organizing principles?

Then your mom brings home *The Rainbow*.

You open to the first page and see the first section heading, “Physics—The Study of Principles that Govern the Universe.” Hmm. Physics first, huh? You read through the lessons and quickly begin to see that this heading is an apt description of what you are learning. Gravity. Electromagnetism. Nuclear Forces. Energy and energy transfer. Work. Motion. Efficiency. And you hardly notice that physics begins to lead you to the physical processes that cause chemicals to interact with one another.

Soon thereafter you enter the next section: “Chemistry—The Study of Substances, Their Properties and Their Interactions.” There you learn that the reason chemicals react is that they are driven to do so by the physical processes that you learned about in physics.

Then, once again, as you are reading through chemistry, you begin to realize that you are now studying the chemistry of living things—*biochemistry*. Fatty acids and lipids. Nucleic acids, DNA and RNA. Amino acids and proteins. This is not arbitrary, as you will learn. The very chemical processes that you learned in chemistry are those that drive the molecules of life to do what living things do.

So now you have seen the layout of science. Physics provides the basis for the workings of chemistry. Chemistry provides the basis for understanding how biology works. In fact, there is a logical continuum from the simplest to the most complex forms of matter:

subatomic particles→atoms→molecules→biopolymers→organelles→cells→tissues→organs→systems→organisms

You will observe that, as we pass from the simplest most fundamental forms (subatomic particles) to the most complex forms (organisms), we pass from the domain of physics to that of chemistry and then to biology.

So then, *The Rainbow* is not just a science course; it is a *map* of science. It answers the questions, “Where am I?” and, “How do I get to where I want to go in science?” In a word—*perspective*. So then, when I take a high school course in Physics, I have an intuitive understanding of where this course fits into the broader subject of science and how this particular branch of science connects to the others. Every career professional has this in his mind, whether or not he/she has ever explained it to themselves.

### Laboratories

What do you remember from your junior high science course? If you are like most people, you remember the time you grew mold on bread, or the time little Johnny tormented the other students with a frog liver on the end of a needle probe. The simple fact is, science is remembered *not so much by what you read, but by what you did*. If you were to become a scientist or a science practitioner (engineer, nurse, etc.), although you will be a reader, you will be primarily paid for being a *doer*. Science is a *practiced* discipline.

Furthermore, the concepts of science come off the page when you actually experience an electromagnetic field for the first time, or you create a new substance by adding two entirely different substances together and see the bubbling of released gases or the “pop” of a miniature explosion. These experiences are mind-altering. You have to make a place for this new knowledge among your acquired, undeniable realities. This is what laboratories do, and we do more than anyone else.

*And* we provide all the stuff. All of it! If you need so much as a straight pin or a piece of paper—BOOM!—it’s right there for you in the lab kit. You can count on it to be affordable and safe in the home environment. You can count on not having disposal issues or oversupply of unneeded materials. It was designed for use in your home.

Most importantly, all those laboratories are done as an illustration of a particular principle that is being taught in the textbook. There is no “That was really cool; what did we just do?” You’ll know what you did and what you learned from doing it.

### How It’s Done

All courses designed by **Beginnings** are done three days a week. Two of those days (let’s say, Monday and Wednesday) are textbook days and the third day (let’s say, Friday) is lab day.

On textbook days students will read the text material and answer the questions. The questions require that the students truly understand the material. We are not given to rote memorization or to repetition of facts at this stage of development. Lessons will generally be completed in 30 minutes or less. You can check quickly for their comprehension by comparing their answers to the ones we provide in the *Teacher’s Helper*.

On lab days, students will get out the lab kit and the laboratory workbook. Each lab starts with the list of things the students will need, all of which will be found in the lab kit. The students will do the labs (entirely on their own if you like—they are intrinsically safe). And you will use the briefing in the *Teacher’s Helper* to know what they are doing, what they are learning, and when they will need supervision (on days, for instance, when they are lighting a match). Labs will generally be completed in 45 minutes or less.

The lab kits are divided into durable and renewable kits. The durable kits can be handed down to younger students in your family (or resold after you are finished with it). The renewables are the parts that can be refurbished for the next student to go through the course, thus saving money on reuse.

### **Public School Equivalency and Course Credit**

Content-wise, the curriculum covers material that is (generally) equivalent to an eighth- or ninth-grade Introduction to Physical Science (IPS) and a tenth-grade Introduction to Biology (Biology I). In contrast to public school curricula, the home environment allows many students to address materials either earlier or later than would be practicable in public or private school because of the variety of performance levels of students in a given public school class. So, while these materials are nominally for 7-9 grades, the actual ages at which students take this course is as varied as the students' abilities and parents' plans for them.

The use of this curriculum for high school credit is appropriate, even when done at earlier ages (see the accompanying document "*The Rainbow* for High School Credit").

The laboratory experiments and demonstrations number 31 per year for the two years. Thus the curriculum exceeds all public school requirements as a laboratory-based curriculum. Experiences in dissection, microscopy and reaction chemistry are integral to the course.

So, that's *The Rainbow*. It's the "YOU ARE HERE" of science, giving your kids solid content, and an abiding sense of perspective on the sciences, driving it home with the doable labs. It's the course that comes with all the stuff you need to do a lab a week without having to go out and buy anything.

Don't forget to check out the accolades from people who have used us! We have been serving the home school community for over 20 years and have students placed in every imaginable discipline of science. But even if your kids will not be scientists, we want them to be deeply impacted by both the marvels and the intrinsic sense of God's world.