



Thank you so much for purchasing this copy of Advanced Physical Science

Hello there! Thank you so much for your willingness to bring this curriculum into your home or classroom. It has taken nearly three years for me to complete this work and I do not believe you will be disappointed. I have worked hard to provide the best physical science curriculum possible. Please in mind that I have built this curriculum as an introductory physics course for high school-aged students.

If you are new to the Classic Science series, the following information will give you an overview of the coming year. For seasoned veterans out there, the format of this text is similarly arranged to the other 36-week curricula within the Advanced series. I'll go into a little more detail with the timeline of this text very shortly.

For now, thank you all so much for your guidance and support these past three years. The requests for this book have been consistent for several years now and I have done my best to bring the same quality (and at times, levity) to this book as I have in the past.

Furthermore, I would like to thank Dr. Russell Clothier for his exhaustive efforts to review and edit this text. His professionalism towards this work can only be matched by his unbelievable patience towards my initial drafts of this text. Thank you Doc and thank all of you once again for your continued interest in "my little project." I could not have achieved so much without your help....

Studying 101

Obviously, there will be a strong emphasis on mathematics within this book. I have included a math primer within the student copy for kids to review some basic concepts called "Chapter 0". The contents of this chapter were taken from my Advanced Chemistry book so if your child has already experienced this high school resource there should be no worries whatsoever. If not - do not panic! Chapter 0 will provide the necessary information for you to understand the importance of accuracy vs precision in our calculations and the rules involved with the use of significant figures.

What type of calculator should you purchase? Whatever you choose, please do not break the bank! There are many online calculators that work just fine and are completely free. If you do wish to make an investment I would recommend any "scientific calculator" on the market. The important functions that are needed involve trigonometric equations (sine, cosine, tangent) and their inverse functions.

What is more important than memorizing any of the equations in this book is the understanding of how they work. I recommend keeping a notebook to highlight the main ideas that are encountered by the student on a daily basis. Note taking is invaluable to a learner as it personalizes the content and allows for a stronger retention of knowledge.

The study of physics is filled with overlapping concepts and definitions. This is another reason for taking good notes as the child reads through the material. I have worked out nearly all of the review and assessment questions to help guide you through the work. Although an emphasis has been placed on the proper use of significant figures within this text, please do not get upset if your answer is off by an insignificant amount. For example, if your answer is 2.016m and the answer key says "2.02m" do not lose your mind! This is not rocket science (well, some of it **is** rocket science, but anyway...) Just stay calm. If you provided me an answer within an introductory high school physics course that demonstrates your understanding of the principles involved, but was off by an amount of 0.01 - I would give you a good grade!

Weekly Timeline

This is a 36-week curriculum for high school-aged students and has been segmented into two-week units each ending with a unit quiz. Each week may be broken down into three separate days to make it easier for you to set up your schedule:

- 1) *The first day of each week contains a reading assignment and a series of practice problems for your child.*
- 2) *The second day can be spent reviewing the answers from the practice problems on the first day, to review the notes for the week, and to preview the weekly lab activity which may require some preparation.*
- 3) *The third day is set aside for a lab activity that will reinforce the concepts being taught that week.*

Unit Quizzes and the (gasp!) Quarterly Tests

Each unit contains a quiz in similar format to the weekly practice problems. Students should study not only their vocabulary terms, but any labeled images throughout the textbook as well. I would highly recommend allowing the child to use a notecard to prepare any equations, concepts, etc. he/she may need for these assessments. It reduces any test anxiety that may be present AND it allows them to write out their notes once again which can only help with their retention!

Four quarterly tests have been created to further assess your child's understanding of the chapter concepts in addition to the unit quizzes. A pre-test has also been provided which contains a similar amount of questions that will be found in the post-test.

Given the possible time requirements to review previous questions and prepare note cards, a full week has been provided to the child within the timeline of this book. Below is the timeline for the first quarter:

Week	Unit	Chapters	Topics
1	1	1	Introduction to Mechanics
2		2	Speed, Velocity, and Acceleration
3	2	3	Graphing Motion
4		4	Gravity and Kinematic Equations
5	3	5	Newton's First Law and Forces
6		6	Newton's Second Law and Friction
7	4	7	Newton's Third Law
8		8	Projectile Motion
9			Quarterly Pre-test and Post-test

I would highly recommend setting up a regular schedule during the testing week. Segmenting these weeks into three or more separate days will make it easier to review the large amount of vocabulary and scientific concepts. Here are my suggestions:

- 1) *The first or second days of each testing week should be spent reviewing the weekly practice problems and unit quizzes. Do not forget to study the labeled diagrams within each chapter as well.*
- 2) *One day should obviously be allowed for your child to complete the test.*
- 3) *An additional day needs to be set aside to evaluate the answers, correct any possible mistakes within the notecards, and for an overall review. This material overlaps many times throughout the year. The tests can be the most powerful learning tool throughout the year.*

Weekly Labs

There are several labs that require some minor construction within this textbook. I have created these activities with the simplest of materials that will provide a maximum amount of enjoyment and education for your child. I cannot stress the importance of looking ahead each week to obtain the necessary materials. A materials list has been provided in the next few pages of this text and can also be found online on my website www.eequalsmcq.com. Most materials can be found at a local grocery/department store; however, some items (such as magnet wire and rare earth magnets) may require a trip to Radio Shack or an online provider.

Future Projects

I'm not even close to being done yet! I have received many suggestions for future books and will be working hard to provide these to you as soon as possible. The best way to keep up-to-date on this development is to sign up for my monthly LabNotes at www.eequalsmcq.com. I'm certain you'll love the free activities I provide each month for you and your family!

I cannot thank all of you enough for your support and willingness to communicate with me these past few years concerning both the Elementary and Advanced series. Are their mistakes in this book? Most likely. Despite multiple edits and having a college professor of physics reviewing my work there will still be errors and for that I apologize. Please let me know if you find them and I will update the book immediately as I have done in the past.

Most people think that physics is far beyond their capabilities and this is simply not true. As with anything in life it takes work and effort to become proficient at a task. Your child will achieve this level by the end of the year. They will stumble and they will get frustrated, but it will work itself out so long as they keep asking questions and searching for the answers.

And thank you for your tireless efforts to guide your children through the concepts of science. Your hard work will not be forgotten in the young lives you are molding right now.

Keep moving forward everyone!

Take care,

Scott McQuerry