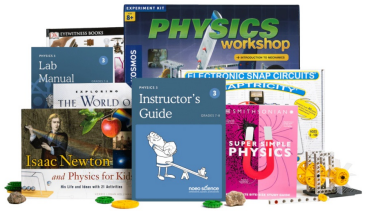

noeo science Physics Grade 3 Book User Guide

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Contents

Introduction: Welcome to Noeo

Welcome to Noeo Science! Thank you for trusting us to provide you with quality materials for teaching science at home. We understand that many homeschooling parents do not have a science background and may feel a bit intimidated about teaching science . . . especially when it comes to the experiments! Our books and experiments have been carefully selected to be of the highest quality available, yet simple enough for even the most science-phobic teachers and students. We intensely searched through library catalogs, websites, and hundreds of books before deciding on what we believe are the "best-of-the-best." We hope that you will agree and we're always open to your comments and suggestions.

Our Instructor's Guides provide a logical, focused progression through the books and experiments. Each week you will find an overview of what your student will learn as well as an answer key for the student lab manual reading and experiment questions. Multiple sources of information are used to teach each science topic. However, you won't need to spend your time searching for books or cross-checking indexes to make the curriculum flow. That work has been done for you!

The Noeo Method

You will find that the Noeo Science curriculum is different from all the rest. Each year of science will fill your child with wonder and excitement as they build a strong foundational knowledge of science. They'll be having so much fun that the learning will come naturally for them . . . and painlessly for you.

Noeo Science is variety-filled, with a structure that is best described as a balance between the classical method and the Charlotte Mason approach. We emphasize narration and summarization, vocabulary development, observation, and the scientific method. We do not promote rote memorization or tests, as we think that this approach is less valuable for long-term retention. The following table illustrates these characteristics:

TEACHING METHOD	CORRESPONDING NOEO SCIENCE CURRICULUM QUALITIES
Classical	• Emphasizes vocabulary development, especially in the younger years. • Develops critical thinking skills and logic through the use of the scientific method. • Incorporates the classical stages of learning, i.e., the Trivium (grammar, logic, and rhetoric).
Charlotte Mason	• Provides the best books available (including “living books”). • Utilizes a child’s natural curiosity to acquire knowledge. “Studies serve for delight”. • Uses narration and notebooks rather than worksheets, tests, or repetitive drills to evaluate learning.

We think it is important to learn science from a variety of sources, using a variety of teaching techniques. Our curriculum does not use the traditional, single textbook approach to science education. We think variety will encourage more interest in science, particularly with younger students. All of the books are carefully selected to allow children to discover the beauty, complexity, orderliness, and wonder of God’s design. While some written work is expected, many hands-on activities are included within the bright, colorful, and well-written books. Living book biographies of many important scientists are included to provide a practical perspective.

Occasionally, a book may introduce a particularly secular viewpoint. We view these times as an opportunity for discussions and encourage you not to skip over or “cover up” this information. We do not provide “canned” answers for these discussions, but encourage instructors to study the issues for themselves and to pray for guidance and understanding in providing answers to each student’s unique questions.

Just as creation is orderly and well organized, we think a good science curriculum should follow an orderly design. Each year of the curriculum will focus on biology, chemistry, or physics. Each of these three foundational sciences is studied independently for an entire year rather than jumping randomly from one subject to another without reason. The study of biology, chemistry, and physics is then repeated at a higher level and in more detail upon the completion of each three-year course of study (e.g. biology in 1st and 4th grade, chemistry in 2nd and 5th grade, etc.). Subjects that overlap multiple science disciplines, such as geology, weather, and astronomy,

are included at logical points within the three major science studies. For example, astronomy is studied in parallel with the study of gravity within the physics curriculum.

NOEO COURSE	APPROXIMATE AGES	GRADE EQUIVALENT	CLASSICAL TRIVIUM STAGE
Biology I Chemistry I Physics I	5–8	1–3	Early Grammar
Biology II Chemistry II Physics II	9–12	4–6	Late Grammar or Early Logic
Chemistry III Physics III	12–15	7–9	Late Logic or Early Rhetoric

Our curriculum is designed on a 4-day per week schedule. If you would prefer to do science twice weekly, then simply complete the first two days of scheduled readings and assignments on your first day, and the last two days of reading and assignments on your second day. Alternatively, you may wish to do all of the reading on the first day and the assignments and experiments on the second day. The key is to understand what works best for you and your children and to adjust the schedule as necessary.

The daily time necessary to complete the assignments will vary with individual student ability and will be based on the content being studied. We provide the following table as a guideline of the approximate time that you can expect to spend on daily assignments:

	4 – DAY SCHEDULE	**2 – DAY SCHEDULE**
Grades 1–3	15–20 minutes	30–40 minutes
Grades 4–6	20–30 minutes	40–60 minutes
Grades 7–9	30–40 minutes	60–80 minutes

Lab Manuals

Ln the Student Lab Manual, your student will answer questions about key points both from their reading and experiments. The experiment questions in particular are centered around drawing results, making observations, asking questions, and making connections–all things that will slowly introduce your student to the scientific method and lab reports.
Younger students may need to “narrate” their descriptions and observations to you or an older sibling. It’s completely up to you to determine the length and amount of detail you expect from your student, but we do encourage you to increase this expectation over time.

Instructor’s Guides

Schedules, answers keys, lists of books and home supplies–it’s all here. Everything you need to make Noeo work for you is right here in the Instructor’s Guide. A list of the supplied books is provided, so that you can keep an eye on exactly which books you need for the course.
Lists of both home and included supplies are at the back of the book. The materials list is organized by weeks; so, if an experiment calls for a carrot, you won’t be stuck with a slowly decomposing root vegetable in your fridge until you need it thirty weeks later.
Every week, you can refer to our provided schedule (flexible enough that you could do it all in 1 day if you’ve got an enthusiastic scientist, or stretch it out as much as you need), overview of the week’s subject matter, and answers to both reading and experiment questions. If your student ends up begging to do more, no need to worry–you don’t work for your curriculum, Noeo works for you.

Resource List

Books

- DK Eyewitness: Electricity, by Steve Parker
- DK Findout! Energy, by Emily Dodd
- Exploring the World of Physics, by John Hudson Tiner
- Isaac Newton and Physics for Kids, by Kerrie Hollihan
- Magnetism (Essential Physical Science), by Louise and Richard Spilsbury
- Physics: Why Matter Matters! (Basher Science), by Dan Green
- Super Simple Physics, by DK

Experiment Kits

- Physics Workshop Experiment Set, by Thames and Kosmos
- Electronic Snap Circuits Snaptricity Set, by Elenco

D A I L Y L E S S O N P L A N S F O R R E A D I N G & EXPERIMENTS

Week 1: Main Branches and Major Scientists

Schedule

	DAY 1	DAY 2	DAY 3	DAY 4
Super Simple Physics	pp. 10–11			pp. 12–14
Isaac Newton and Physics for Kids	pp. ix–16	pp. 17–38	pp. 39–63	pp. 64–77

Overview

Physics is one of the hardest and most rewarding of the sciences—the study of motion and force in the real world. This week begins with an introduction to physics, including its history.

Don’t get lost in the details; focus on the big picture. Most of the important terms and concepts are going to be noted in the reading instructions for each day.

Remember that science can refer to two things: 1) science is the process we use to answer questions about the physical world we see around us (testing with experiments), and 2) science is the body of knowledge other people (scientists) have collected by using the scientific process (or scientific method). As you’re doing the second kind of science (reading what other scientists have learned), you won’t have many experiments you can do in your home about, say, quantum mechanics. Don’t worry about that—experiments are coming soon!

Reading Questions

DAY 1

1. According to Super Simple Physics, what is a hypothesis? A hypothesis is a possible explanation that can be tested.
2. What is a theory? A theory is a hypothesis that is tested many times and never fails and is eventually accepted by scientists.
3. According to Isaac Newton and Physics for Kids, what complex models did Isaac Newton build? He built models of mechanical objects like clocks, watermills, and windmills.
4. Where did Isaac Newton attend college? He attended Trinity College at Cambridge University.

DAY 2

1. What did Aristotle believe the earth-bound or “terrestrial” region was made up of? He believed it was made up

of four elements—earth, water, air, and fire.
2. What kind of motion did Aristotle think happened in outer space? He thought that things moved in exact circles, always in good order, everything perfect, and nothing changing.
3. Who were the sizars? Sizars were the poorest students at Cambridge, whose fathers owned small farms or served as clergy. These students had to work to payfor their education, food, and lodging.
4. Who was John Wickins? Wickins was Newton's roommate and only true friend at Cambridge and his work assistant for two decades.

DAY 3

1. How did Descartes work out geometry problems in real space? He applied algebra to geometry and called his new mathematics "analytical geometry".
2. What caused Newton to be elected to membership in the Royal Society? Newton built a reflecting telescope.
3. What did Newton discuss in his paper, "Properties of Light"? Newton discussed his ideas on light, chemistry, and a mysterious flow of a substance he called "ether" that kept planets in orbit around the sun.
4. What did Leibniz call his new branch of mathematics? He called it calculus.

DAY 4

1. According to Super Science Physics, what is genetic engineering? Genetic engineering can provide cures for diseases or alter crops to provide additional nutrients.
2. What are biofuels? Biofuels are fuels made from crops.
3. According to Isaac Newton and Physics for Kids, how did Newton apply his own version of the scientific method to alchemy? He designed experiments with metals, acids, and bases.
4. Why did Newton and Galileo fear speaking freely about their beliefs? In their day, people who spoke against the government or the Church faced punishment and even death.

Week 2: How We Use Energy

Schedule

	DAY 1	DAY 2	DAY 3	DAY 4
Physics: Why Matter Matters!	pp. 4–7			
Isaac Newton and Physics for Kids	pp. 78–92	pp. 93–102	pp. 103–114	pp. 115–122

Overview

Read about Isaac Newton, and remember, every scientist started out as a kid asking questions.

Reading Questions

DAY 1

1. What famous book of Newton's did Halley help get into print? He helped get the Philosophiae naturalis

principia mathematica (Mathematical Principles of Natural Philosophy) into print.
2. What did Halley predict about a comet? He predicted that it would return to Earth 75 or 76 years after its appearance in 1682.
3. What was Newton's theory of universal gravitation? His theory was that gravity works far out in space in exactly the same way it works on Earth.

DAY 2

1. Who was the Catholic king that tried to impose Catholicism on England but failed and fled to France? King James II was the king.
2. What position did Newton's friend, Samuel Pepys, have? He was the president of the Royal Society.
3. Why did Newton want to move to London? It became clear to him that London was the seat of intellectual fever in England, and he could connect with powerful men at the Royal Society who could publish his work and communicate it to the rest of Europe.
4. What job did Newton start at the age of 53? He became warden of the mint.

DAY 3

1. What society did Newton become president of in 1703? Newton became president of the Royal Society.
2. What was discovered about the Monument that Hooke and Wren had designed? Hooke and Wren had designed the Monument to serve as a science laboratory, and the pillar was designed for experiments that needed heights.
3. What did John Flamsteed take decades to build? He built huge catalogs, records of data that tracked the motion of the moon, planets, and stars through the heavens.
4. Who documented the legendary tale of Newton and the falling apple? John Conduitt, Newton's nephew-by marriage, wrote this down.

DAY 4

1. Where was Newton's body finally laid to rest? His body was laid to rest beneath the floor in the western end of Westminster Abbey.
2. In 2005 what contest did Isaac Newton win? He won the contest for "The Greatest Scientist Who Ever Lived".

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