

# INTRODUCTORY PHYSICS

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COURSE NO. SCI-275

Below is our suggested 36 week lesson plan for Introductory Physics using “Usborne Book of Science” as a guiding text. “Usborne Book of Science” is three books in one; this course covers just the Physics section of the book, Pages 1 - 48. We recommend the student develop a science notebook for this course where vocabulary words and other information can be recorded, cut and pasted, sketched and whatever else you can think of.

Early in the week have a short academic lesson. Have the student read the two+ page chapter—aloud, if at all possible. Usborne really packs a page with information and it’s easy to overlook key points; reading or recording the articles aloud will help the student be more thorough in his study. Give the student the list of new vocabulary words and a gel pen and tell him to circle the words in the text, then find definitions for them and record them in his notebook. If there are posters, charts, graphs or tables to reproduce, have him do this also in his notebook. Keep these posters simple unless the student wants to make this his project for the week; they can be photocopied and glued into his notebook, if you would like.

Now send the student out to find a film, book or reading, do an experiment, project or demonstration, or write a written report related to the week’s lesson to present later in the week in a longer class session. If none of these activities are available, have the student outline the chapter CLOSELY. (Note: outlining is an advanced skill. Be patient with your student. Coach him through the first three or four outlines with great gentleness.)

Late in the week, have the student give or complete his presentation and enter notes about it in his science notebook—the instructions to the experiment or project, or his outline for an oral presentation, or a photo of him next to his activity, or a copy of the report, or a photocopy of the film’s cover with a short paragraph attached introducing the film, or a copy of his chapter outline—whatever the student can think of to remind him of his experience of the week when leafing through this notebook with you at the end of the year. There are lots of options for activity for this course so choose according to your family’s abilities and opportunities.

Some resources for experiments and activities are Stratton House’s “Home Science Adventure Kits”, “Janice VanCleave’s Physics for Every Kid”, “Developing Critical Thinking through Science/Book 2”, and Tivola’s computer game “Physicus.” See Rainbow Resource, or NASCO Catalogue Sales at 1-800-558-9595 or [www.enasco.com](http://www.enasco.com).

Quarterly, prepare vocabulary tests for all words studied thus far in the course (including previous quarters’ vocab), using a word-bank/fill-in-the-blank format. If the test is done opened-book, secure the glossary pages in the book and have the student find the terms in the readings. Deduct one letter grade level for opened-book testing.

For quarterly reporting, be sure to identify this text is being used for physics. Report progress by STAA course plan week, following. For a work sample, see the recommendations below in the course plan, or photocopy one of the notebook pages, send a copy of the vocabulary test or report, or something that will illustrate what the student has been doing for the quarter and how well he has been doing it.

## BOOKS TO USE

*Usborne Book of Science: An Introduction to Biology, Physics and Chemistry*

J. Chisholm

[Book Information: Usborne Publ. Ltd., London, Eng./EDC Publ, Tulsa, OK; 1993; 144 pages; 3 sections; 25 lessons; glossary; charts, graphs & tables.] Order From: Rainbow Resource / Order # 005148 / \$12.75 / ISBN: 0746008309

*Home Science Adventures : Magnetism Adventure*

Stratton House

[Book Information: "This mini-course takes your children from "opposite poles attract", all the way through electromagnets and making their own motor. Comes with 20 experiments in 13 lessons, parent guide, and enough equipment for two children working together to share." - Stratton House, [www.homeschoolscience.com](http://www.homeschoolscience.com)] Order From: Rainbow Resource / Order # 004356 / \$25.25 / ISBN:

*Physics for Every Kid: 101 Easy Experiments...*

Janice VanCleave

[Book Information: 256 pages; Jossey-Bass (March 1991)] Order From: Rainbow Resource / Order # 012848 / \$10.5 / ISBN: 0471525057

*Developing Critical Thinking through Science : Book II*

Paul Eggen, June Main

[Book Information: Critical Thinking Press, Pacific Grove, CA; 1990; 262 pages; 17 units; 80 activities; unit reviews; glossary; reproducible 4-page science report form (Pages 258-262).] Order From: Rainbow Resource / Order # 011438 / \$29.99 / ISBN: 0894554220

*Physicus : Save the Earth With Science (CD-ROM)*

[Book Information: CD-ROM; Tivola Electronic Publishing] Order From: Retail or Amazon.com / Order # / \$19.99 / ISBN: 3934789129

LESSON PLANNING		SCI-275 INTRODUCTORY PHYSICS
Week 1		a. Preview materials. b. Preview study plan. c. Identify and discuss resources for end-of-week presentations.
Week 2		a. Read p. 3, "What is physics?" b. Create a poster of "Basic Quantities," p. 45, including the introduction. c. Create another poster of "Derived Quantities," p. 45, including the introduction. (NOTE: These posters will become more meaningful over the length of the course. The information they contain will be used in any high school physics course. Prepare the posters for reference use in high school, binding them neatly in a science folder or binder section.)
Week 3		a. Read pp. 4-5, "All about energy." b. Create a poster of "Energy," p. 44, column 2. c. Define and locate in the text the following vocabulary words: chemical energy, energy, gravity, joule, J.P. Joule, kinetic energy, potential energy, solar panels, strain energy, telephone, turbine. d. Do an experiment, give a demonstration, write a report or view a film on a topic related to the reading or outline the chapter closely.
Week 4		a. Read pp. 6-7, "Light energy." b. Create a poster of "Velocity of Waves" equation, p. 44, column 1. c. Define and locate in the text the following vocabulary words: amplitude, electromagnetic spectrum, frequency, heat energy, heat waves, light energy, radio, shadows, speed of light, sundial, television, wavelength, X-rays. d. Do an experiment, give a demonstration, write a report or view a film on a topic related to the reading or outline the chapter closely.
Week 5		a. Read pp. 8-9, "Seeing things." b. Define and locate in the text...: camera, concave lens, convex lens, eye, light rays, longsight, pinhole camera, retina, shortsight. c. Do an experiment, give a demonstration....
Week 6		a. Read p. 10, "Reflection." b. Create a poster of "Light", p. 44, column 1. c. Define and locate in the text...: image distance, angle of incidence, light rays, mirror, normal (reflection), object distance, reflection. d. Do an experiment, give a demonstration....
Week 7		a. Review pp. 3-10. b. Memorize all terms for testing. c. Organize your notes and folder/binder for this subject. (Note to teacher: Use review weeks for catch-up when necessary.)
Week 8		a. Take a test on all vocabulary terms studied this far. b. For this quarter only, list the experiments, demonstrations, reports or posters done; write a short, short paragraph about each film you watched for this course; and make a list of the titles of the chapters you outlined.
Week 9	[End of Quarter 1]	a. Prepare a quarterly report for this course with your teacher. b. Include "a" and "b" from Week 8 as your representative work sample. (Note to teacher: Use quarterly reporting weeks for catch-up when necessary, preparing the quarterly report for your student.)
Week 10		a. Read p. 11, "Refraction." b. Define and locate in the text...: critical angle, fiber optic cable, glasses, light rays, normal (reflection term), periscope, refraction, total internal reflection. c. Do an experiment, give a demonstration....