

# **“Teaching” The Junior High and High School Sciences At Home**

**by Dr. Jay L. Wile, Ph.D.**

## **Qualifications**

- University Professor From 1990 - 1995
- Helped Develop Indiana’s Only Residential High School for Gifted and Talented Students
- NSF-Sponsored Scientist with More Than \$200,000 In Research Grants
- Became Interested in Homeschooling Because of Excellent University Students Who Were Homeschooled
- Currently writes junior high school and high school science courses for homeschooled students

## **Why Do I Need to Teach Science?**

- Public schools teach it, and you are trying to give your student a better education.
- Today’s society is so technologically-based that you need a basic grounding in the sciences to be successful in most fields.
- All colleges require at least two semesters of science and two semesters of math, regardless of your major.
- Your student may be perfectly suited for a career in the sciences. This is how to find out!

## **Can I teach high school science? ---- NO**

As your student gets older, your role changes from teacher to fellow learner.

NOTE: Never force your child to learn what you can’t or won’t learn yourself.

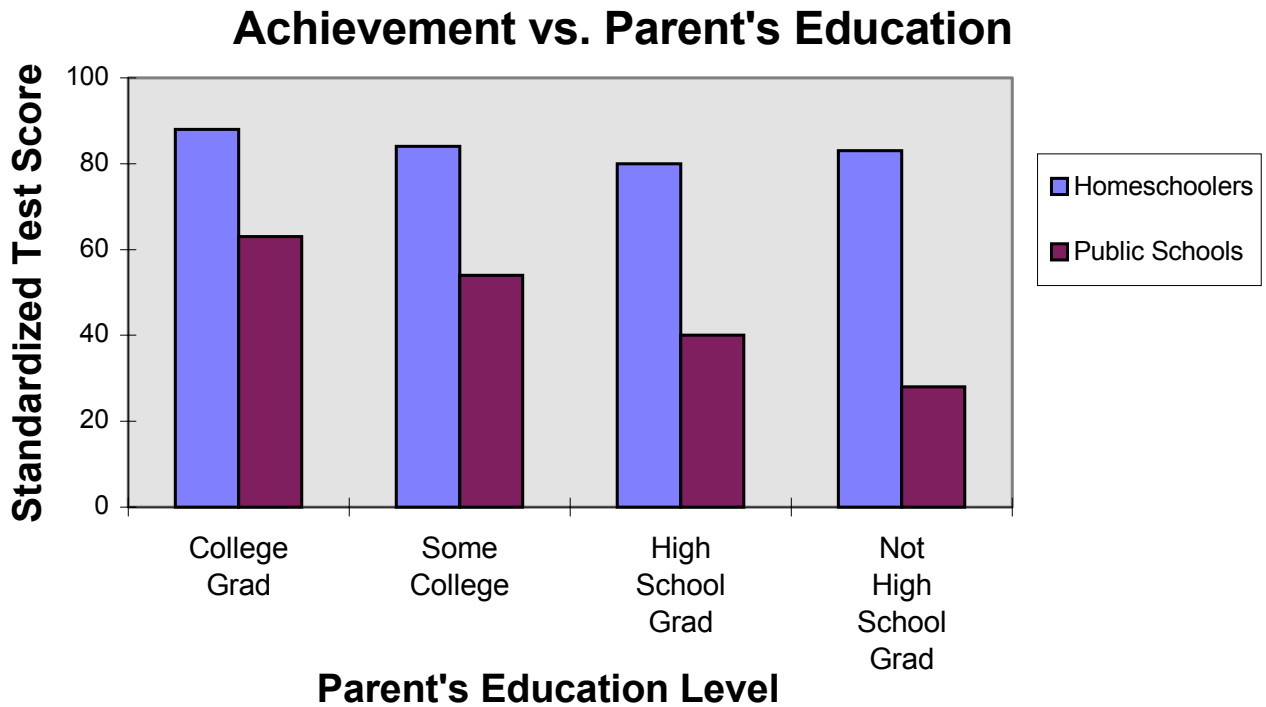
## **But can I do it? --- YES**

- IF YOUR KIDS CAN LEARN IT-YOU CAN TOO!!!!
- LEARNING FROM READING IS THE MOST PRODUCTIVE KIND OF LEARNING
- IF OTHERS CAN DO IT - YOU CAN TOO !!!!!!

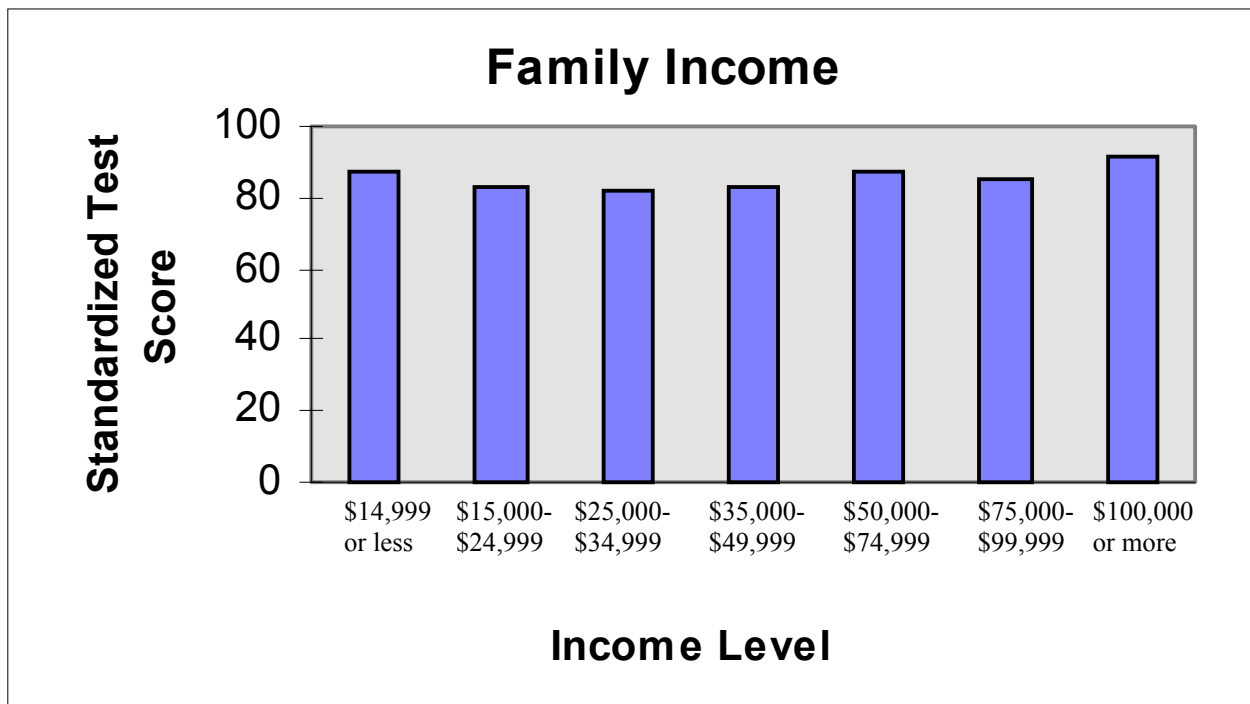
## **Even at the High School Level, homeschoolers are better at science than publicly and privately schooled students**

- In the ACT, homeschooled students scored 21.9 in science compared to the national average of 21.1. This is equivalent to a 70 point superiority in the SAT, or about 10 percentage points.
- Several large studies in Montana, Oklahoma, Washington state, Canada and across the USA report homeschoolers at the high school level score from 68 to 88 percent on standardized science tests, compared to the national average of 50%.

The Quality of a Home Education DOES NOT Depend on the Parent's Level of Education!



The Quality of a Home Education DOES NOT Depend on the Parent's Income!



## MATHEMATICS: A NECESSARY TOOL FOR LEARNING THE SCIENCES

“Diplomacy without arms is like music without instruments”

-Alexander the Great

“Science without math is like music without instruments”

-Jay Wile the Not-So-Great

## MATH TOOLS NECESSARY FOR LEARNING THE SCIENCES

**BIOLOGY:** Metric Units

**CHEMISTRY:** ARITHMETIC and ALGEBRA: (*Algebra 1, Saxon*)

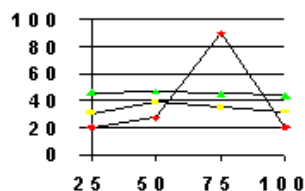
Fraction Manipulation:  $\frac{7}{\cancel{64}} \times \frac{\cancel{64}}{13} = \frac{7}{13}$

Positive and Negative Numbers:  $-122.45 + 567.3 = 454.85$

Manipulating exponents:  $10^2 \times 10^3 = 10^5$

Algebraic Manipulation:  $PV = nRT \rightarrow n = \frac{PV}{RT}$

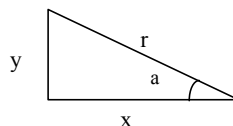
Reading Graphs and  
Understanding trends:



# MATH TOOLS NECESSARY FOR LEARNING THE SCIENCES

PHYSICS : Should have finished Algebra II and be at least starting Trigonometry (*Algebra II*, Saxon)

Using Trig in Triangles:



$$y = r \sin a$$

$$x = r \cos a$$


$$y/x = \tan a$$

ADV. CHEMISTRY : Should have finished Algebra II

Logarithms:  $\log(x) = 3 \rightarrow x = 1,000$

$$\log(xy) = \log(x) + \log(y)$$

ADV. PHYSICS: Should have finished Precalculus (*Advanced Math*, Saxon)

	Not Science-Oriented	Science-Oriented	Math Prerequisite
Seventh Grade	General Science	General Science	None
Eighth Grade	Physical Science	Physical Science	None
Ninth Grade	Biology	Biology (Supplement I)	None
Tenth Grade	Chemistry	Chemistry (Supplement II)	Algebra I
Eleventh Grade	Physics	Physics (Supplement III) 	Algebra II; At least beginning trig
Twelfth Grade	Supplements	Advanced Biology OR Advanced Chemistry OR Advanced Physics	None Algebra II Precalculus

## A Word About the Timeline

- Your student's math level should drive this time line, especially if the student is science-oriented. When the student *begins* Algebra I, that's when Biology begins.

- You don't really need set science curriculum for the years leading up to junior high school. To expose your student to the sciences, get books about science-related topics that the student is interested in.

*Considering God's Creation* - Eagle's Wings Publications  
P.O. Box 502. Duncan, OK 73534 580-252-1555  
*Teaching Critical Thinking Through Science* (2 volumes) -  
Critical Thinking Books & Software 800-458-4849  
<http://www.criticalthinking.com/>

### **Apologia Science Curriculum**

*Exploring Creation With General Science*  
-Dr. Jay L. Wile

*Exploring Creation With Physical Science*  
- Dr. Jay L. Wile

*Exploring Creation With Biology*  
-Dr. Jay L. Wile and Marilyn Durnell

*Exploring Creation With Chemistry*  
-Dr. Jay L. Wile

*Exploring Creation With Physics*  
-Dr. Jay L. Wile

*Advanced Chemistry and Creation*  
-Dr. Jay L. Wile

*The Human Body: Fearfully and Wonderfully Made!*  
-Dr. Jay L. Wile and Marilyn Shannon

*Advanced Physics and Creation*  
-Dr. Jay L. Wile

### **Another Good Science Curriculum**

*The Rainbow* by Beginnings Publishing House: Grades 7 and 8

Phone: (800) 831-3570  
<http://www.beginningspublishing.com>

More experiment-oriented than our courses - less reading - fewer topics.

## PHILOSOPHY OF APOLOGIA MATERIALS

### 1. Assumes that the parent and the child know *nothing* about the subject

→ Nearly twice as long as a classroom text

→ All student exercises have **DETAILED SOLUTIONS**

### 2. Designed to provide exactly what the student needs to be successful in the relevant college course

The texts provide exactly what the author wanted his college students to know when they came to his class.

### 3. Support the concept of creation where appropriate.

Texts are not designed as an argument for creation, but if a topic arises that clearly indicates design in nature, it is highlighted.

### 4. We have advance topics for science-oriented students. Students can take up to six years of high school science, if they have the time!

### 5. Labs are fun and interesting, but not a necessary part of learning.

Einstein, Fermi, etc. never saw a lab until *graduate school*

Labs use household chemicals and mostly household supplies

Biology lab can be expensive if you choose to do the microscope labs. About half of the labs in the course can be done without any special equipment, however.

### 6. Correspondence curriculum help available through FAX, E-MAIL, and US MAIL.

### 7. GRADING:

Make the student take tests, and grade them with partial credit. If a student does everything right but makes a small error in the calculation, you should not take off the full amount.

Give the student a lab grade. The grade should not be based on the *results* of the experiment. Rather, it should be based on the student's write-up.

The student's final grade should be 65% tests and 35% lab.

### 8. Money Back Guarantee

## **Supplement I**

*Evolution: Fossils Still Say No!*, Dr. Duane T. Gish, Master Books

*Reasonable Faith: The Scientific Case for Christianity*, Dr. Jay L. Wile, Apologia Educational Ministries

## **Supplement II**

*What is Creation Science*, Dr. Henry M. Morris and Dr. Gary E. Parker, Master Books

*Environmental Overkill: Whatever Happened to Common Sense?* Dixy Lee Ray, Regnery Gateway

*Earth in the Balance: Ecology and the Human Spirit*, Albert Gore, Houghton Mifflin

## **Supplement III**

*Evolution: A Theory in Crisis*, Dr. Michael Denton, Adler&Adler

*Darwin's Black Box: The Biochemical Challenge to Evolution*, Dr. Michael Behe, Touchstone Books