

Teaching Critical Thinking

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Qualifications

- Ph.D. in Nuclear Chemistry
- University Professor 1990-1995
- NSF-sponsored scientist with >\$200,000 in research grants
- Published over 30 articles in nationally recognized peer reviewed journals
- Currently writes junior high and high school science curriculum for homeschoolers
- Got interested in homeschooling because of homeschool graduates in my university courses

Critical Thinking: What's the Big Deal?

People in the US, even well-educated, intelligent people, get scammed all of the time!

- ↳ Environmental extremist propaganda
- ↳ Money-making pyramid schemes
- ↳ Products (like the LAUNDRY BALL) that make ridiculous claims
- ↳ Untrue stories that promote a certain belief or agenda
- ↳ Cults

What is Critical Thinking?

Critical thinking is a disciplined manner of thought that a person uses to assess the validity of a statement, news story, argument, proposition, etc. It is based on: Asking questions, Examining Evidence, Looking at all sides, Analyzing Assumptions and Biases, and Avoiding Emotion and Personal Desires

NASA and the “Missing Day” - An illustration of how to apply critical thinking.

Mr. Harold Hill claims that an Engineering team at NASA was running orbit calculations for the planets in the solar system. They have to do this for the proper placement of satellites. The engineers were running the orbital calculations “back and forth over the centuries” when the computer suddenly stopped and generated an error message, stating that a day was missing in “space time.” This, then, was scientific evidence for the sun standing still for “about a whole day” as reported in the book of Joshua. The calculations indicated that *exactly a day* was missing, however. The rest of the “missing day” comes from 2 Kings, when the sun’s shadow went backwards at the command of Isaiah.

This story is absolutely false, and ANYONE should be able to figure that out!

ASKING QUESTIONS

- ⇒ Why would the scientists run the calculations backwards?
- ⇒ How would the computers know what happened in the past?
- ⇒ Why hasn't this been made public?

EXAMINING EVIDENCE

- ⇒ There is no evidence given in the story.
- ⇒ No references indicating a place you might look for confirmation
- ⇒ No particulars about the orbit calculations.

ANALYZING ASSUMPTIONS AND BIASES

- ⇒ The story starts: “Did you know that the space program is busy proving that what has been called ‘myth’ in the Bible is true”
- ⇒ A “Christian Man” is credited for figuring out what the error message meant and “enlightening” the scientists.

AVOIDING EMOTION AND PERSONAL DESIRES

- ⇒ All Christians would LOVE for this to be true!
- ⇒ Most creationists would LOVE for the irony of evolution-based NASA “proving” the Bible!

LOOKING AT ALL SIDES

- ⇒ If you go to NASA’s website and search on “missing day,” you will find a refutation of the story.
- ⇒ Most reference librarians know this story and how to refute it.

How Do We Teach This To Our Children?

Have them learn from history.

- Read commentaries of past examples of people not thinking critically
- Examine past examples and try to determine what happened

Have them examine current controversies.

- Political Issues
- Science issues

Encourage them to be skeptical of people’s and products’ claims.

Use curriculum that encourages critical thinking.

Piltdown Man: Evolutionists not thinking Critically

This was a poorly-faked fossil that was supposed to be a transitional form from apes to humans. The commentaries I have read indicate that the forgery was VERY poor, but evolutionists bought it anyway. Speculations of why it became accepted can be found in:

- Steven Gould writes about it in his book, *The Panda's Thumb: More Reflections on Natural History*. New York: Norton, 1980. pp. 108-124.
- A comprehensive website on the subject is http://home.tiac.net/~cri_a/piltdown/piltdown.html

Y2K Hysteria: An example of Christians not thinking critically

In this situation, there are not a lot of resources (yet) that discuss *why* so many Christians were fooled by the Y2K alarmists, but you can have your student look at both sides of the issue, knowing who was right in the end.

- *The Millennium Bug: How to Survive the Coming Chaos*, by Michael Hyatt, is an example of the alarmist view
- *Y2K: A Reasoned Response to Mass Hysteria*, by David Hunt, is an example of the other side

Have your student read both books and, knowing now who is right, have the student write an essay postulating why people were fooled by the first argument.

The Environmental Debate: Looking at both sides!

- *Environmental Overkill: Whatever Happened to Common Sense?*
Dixie Lee Ray, Regnery Gateway
- *Earth in the Balance* Hon. Albert Gore, Houghton Mifflin

Have your student read a corresponding chapter from each book and write an essay about what he or she thinks is right.

Evolution: A Study in Scientific Critical Thinking

- *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe Without Design*
Richard Dawkins, WW Norton & Co.
- *What Is Creation Science?* Morris & Parker, Master Books

The Anti-Vaccination Movement: An Excellent Example of Looking at Both Sides of the Issue.

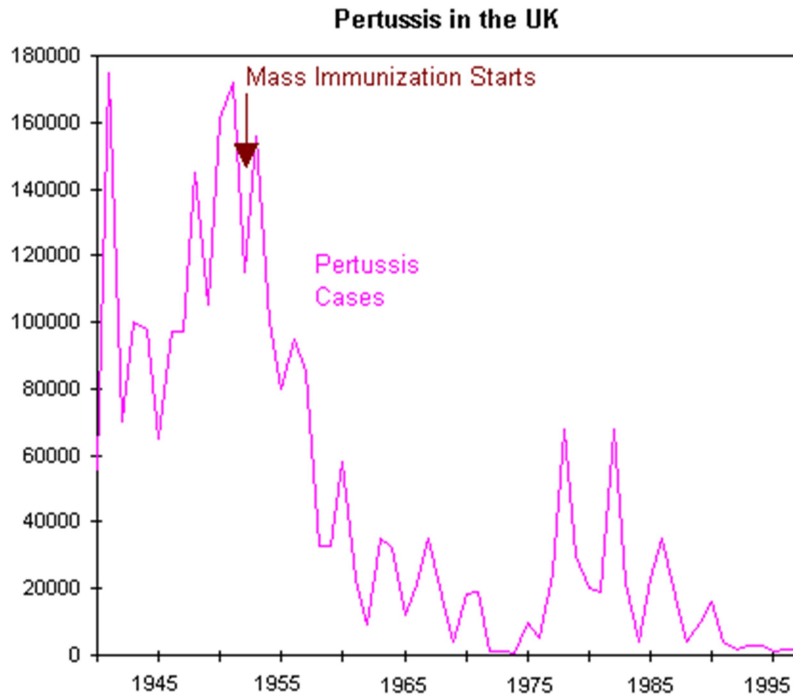
Anti: Vaccines : Are They Really Safe and Effective? : A Parent's Guide to Childhood Shots
by Neil Z. Miller

<http://www.trufax.org/vaccine/vaccmyth.html>

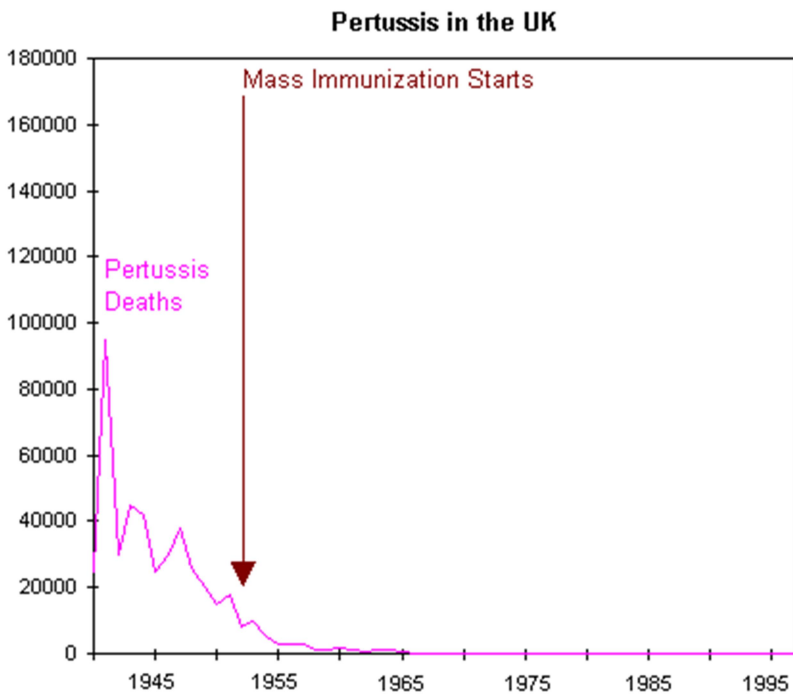
Pro: Vaccines: What Every Parent Should Know
by Paul A. Offit and Louis M. Bell

<http://www.apologia.com/vaccines.htm>

Pro:



Anti:



The key is that both sides are presenting factual evidence and leaving out information as well. The DISEASE RATES fall only after vaccination begins. However, DEATH RATES from a disease fall REGARDLESS of the number of disease cases, because medical science learns how to TREAT the disease long before it learns how to PREVENT it.

Pro:

When a measles outbreak occurs in a school, the vaccinated children are 22 TIMES less likely to contract the disease than are the unvaccinated children.

Anti:

When a measles outbreak occurs in a school, the majority of students (usually about 60%) who get the disease are vaccinated.

Once again, both sides are presenting factual information. What is missing is one key fact: the VAST MAJORITY of students in school are vaccinated. Only a TINY PERCENTAGE of vaccinated children get the disease, and nearly 100% of the unvaccinated children get the disease. However, a tiny percentage of vaccinated children is a LARGER NUMBER than 100% of the unvaccinated children.

Encourage Your Children to be Skeptical of People's and Products' Claims!

USA Pharmacal Sales sells all natural weight-loss herbs.

“Yes, a totally different kind of reducing program that each day, blocks out both fat and sugar calories by the hundreds, from entering your system... actually neutralizes the calories in all the food you eat before those excess calories can turn to flab and fat... and that SLIMS YOU DOWN AND FIRMS YOU UP FASTER, SAFER, SURER THAN EVEN TOTAL STARVATION! Yes, melts down fat and carves away inches SO FAST, that in just the first 48 hours alone, excess fat burns away at such a staggering rate of speed, you actually:
LOSE up to 1 FULL POUND EVERY 8 HOURS
LOSE up to 2 1/2 to 3 FULL POUNDS EACH DAY”

“Clinically Proven” - Money-Back Guarantee! - Testimonials

There is no credible scientific evidence that it works!

Although the internet is a great resource for information, it is also a great resource for lies:

- ☞ Vitamin C and shrimp are **NOT** a poisonous combination.
- ☞ It is **IMPOSSIBLE** for a company to give you money or other prizes by tracking the number of E-MAILs that you forward!
- ☞ Charles Darwin **DID NOT** renounce evolution and become a Christian on his death bed.

To avoid being fooled by such nonsense, seek a reputable source that evaluates such claims, like:

<http://www.truthorfiction.com>

Curriculum That Encourages Critical Thinking

Critical Conditioning by Kathryn Stout (Design-A-Study)
408 Victoria Avenue • Wilmington, DE 19804-2124
Phone/Fax: (302) 998-3889 • <http://www.designastudy.com/>

This book details reading comprehension skills in a way that encourages critical thinking while you read. A very good book for initially training a student in critical thinking. (Ideal in late elementary or early junior high.)

Critical Thinking About Geography Walch Publishing
Geography series that adds a critical thinking dimension!
<https://www.rainbowresource.com/proddtl?id=011244>

A good geography curriculum that adds a critical thinking dimension!

Building Thinking Skills by Critical Thinking Books & Software
800-458-4849 • fax 831-393-3277 • <http://www.criticalthinking.com/>

Primary (preK-grade K)
Beginning (grades K-1)
Book 1 (grades 2-3)
Book 2 (grades 4-6)
Book 3 (grades 7-12)

Developing Critical Thinking Through Science Main & Eggen
Book One (grades 1-3)
Book Two (grades 4-8)

Arguments A-1 : Critical Thinking Activities to Improve Writing Skills by Michael Baker
<http://www.amazon.com>

Ideal for late junior high/early high school. Emphasizes thinking and writing skills.

Cornerstone Curriculum (David Quine)
2006 Flat Creek • Richardson, Texas • 75080972-235-5149
<http://www.cornerstonecurriculum.com>

Good Math (especially K-8), Music, Arts, and World view curriculum. Critical thinking is stressed throughout.

Exploring Creation With... Science Curriculum
Apologia Educational Ministries, Inc. • 888-524-4724
<http://www.highschoolscience.com>