ENSIWEB HIGHLIGHTS for 2012 – 15th Year of ENSIweb
What Did We Do in 2012?

ANNOUNCEMENTS POSTED DURING THE YEAR:
28 November 2012
Two New Items on Bias:
1. Alternative article to Women’s Brains: Confirmation Bias in Science by Physicist Chris Lee. Article describes two examples of confirmation bias. Includes the value of double-blind studies where judgment is involved in the results (as is common in many pseudoscience topics, where double-blind tests are not used, or used poorly).

Lee also shares one of his own experiences with a new scientific idea, develops a theoretical model, and tests the model (tries to destroy the model). He then shares what happened when he presented the idea to his peers at a conference. In this context, the author points out a key difference between science deniers and scientists.

2. Investigative Study (New Lesson): Therapeutic Touch: An Inquiry
Students perform a single-blind study that tests the “placebo effect” in friends and family. The placebo effect is a form of confirmation bias. Class discussions follow.

27 October 2012
NOS Additions to Site: What IS the Nature of Science? Go here to find these added pages:
- NOS: Ten key Concepts
- NOS Elements & Benefits
- Science Assumptions & Limits
- NOS-ENSI Lesson-Selection Matrix (shows NOS elements stressed in each NOS lesson)

STEM lessons already on the ENSI site (list)
Science IS – is NOT worksheet: New Summary Worksheet (developed by SS field-testing MS teacher Christine Evans) for use with this part of the Sunsets, Souls & Senses lesson.

Link to Misconceptions by Teachers for Teaching the Nature and Processes of Science on the Understanding Science website. Excellent for deciding to spend more time on NOS topics – or not.

23 August 2012
The Growing Need for Solid Introduction to Evolution and Medicine in High School Biology (7 reasons)

25 July 2012
New Additions: Links to...
- Teaching Evolution In Middle School (Nate Fairchild’ revised site)
- Teaching Evolution: HHMI’s New Resource Guide
- Ensatina Ring Species (extended study on the Understanding Evolution site).
Includes phylogeny and DNA work of the CA salamanders used in the ENSI lesson A Step in Speciation.
2 July 2012
New Items:
- The Guppy Game (an engaging new lesson on natural selection, on the Neuron website)
- Bones, Stones & Genes– The Origin of Modern Humans (New HHMI DVD) – a Review
- Pseudogene Suite lessons are back: very compelling DNA evidence for common ancestry.

24 March 2012
New Additions and Repairs:
- Investigating Evolution Questions (tutorial) lesson: updated versions of the Student Instructions.
- One-Gene-One-Enzyme ppt animation – using GULO pseudogene as an example.
- Women's Brains lesson: added link to commentary about Gould’s own bias on this!
- Worksheet Extensions Index: 3 worksheets on chromosomes and speciation by Tom Mueller:
  - Chromosome Shuffle, Human-Chimp DNA, Strange Case of Oliver the Chimpanzee.
  - Chromosome Speciation Dialog Index with Definitions & Explanations
- Quick Speciation activity – an example of allopatry in the classroom.

VISITS TO THE ENSI WEBSITE in 2012
Total Hits: 34685
Avg./mo: 2890
Hi: 4850 (February) Secondary Hi: August and September (3600)
Lo: 1503 (December) Secondary Lo: June (1911)
This sorts out to an average of about 95 hits per day to the Home Page – and this doesn’t count the hits to other pages directly from internet searches.

LESSONS BEING REVISED
Our lesson “When Milk Makes You Sick” is still in revision (lots of new information to be integrated).
- Pseudogenes Suite: Vitamin C & Common Ancestry lesson is back, except for part C. We are looking for someone who would like to update that tutorial (for using online DNA searches).

EVOLUTION SURVEY
Our Evolution Survey is still very popular. Requests for the key keep coming – usually 3-4 per week during school year. Many teachers use this as pre/post test, comparing pre/post scores on item analysis to see degrees of change. An Excel spreadsheet is available on the ENSI site to give percent change for each item (or each student). This can reveal if misconceptions have been reduced, or not – to be dealt with later, or next year.

REBUILDING THE ENSI WEBSITE
Efforts to rebuild the ENSI website have been put on the back burner. The site seems to continue working just fine, and lots of other projects have higher priority.

NEW ENSI WEBSITE CO-MANAGER CANCELLATION
For several personal reasons, anticipated co-manager Beth Kramer had to bow out. We were sorry to lose her. That means the site is currently without a backup manager. We are still open to consider bringing in a science teacher familiar with the ENSI site and the ENSI mission. If you fit this description and have website maintenance experience, and perhaps anticipate retirement in the near future (to give you the time to work with the site), please contact webmaster Larry Flammer.
HOMINID CHROMOSOMES ARTICLE:
Look for the February edition of the NABT journal, The American Biology Teacher. In that issue, you will find an article on “Chromosome Connections: Compelling Clues to Common Ancestry” by ENSIweb Webmaster Larry Flammer. Here’s the abstract of that article:

Students compare banding patterns on hominid chromosomes, and see striking evidence of their common ancestry. To test this, the human #2 chromosome is matched with two shorter chimpanzee chromosomes, leading to the hypothesis that human chromosome #2 resulted from the fusion of the two shorter chromosomes. Students test that hypothesis by looking for (and finding) DNA evidence of telomere segments at the fusion site, reinforcing the likelihood of our common ancestry with chimps, and showing us that we all carry the “molecular fossils” of telomere fusion! Students see how multiple lines of evidence make a compelling case for common ancestry, and they experience an important element of inquiry: testing hypotheses.

The cover of hominid matching chromosomes that was supposed to accompany that article in last year’s February ABT did appear on the April issue, but the article itself was reserved to publish in this year’s February issue featuring evolution lessons. The article also has that same full page photo of the detailed diagrams of hominid chromosomes. The figure is also available directly from the ENSI site at http://www.indiana.edu/~ensiweb/lessons/chr_4_all.pdf

NEW STUDENT BOOKLET ON THE NATURE OF SCIENCE:
In the works is a new booklet for students, called Science Surprises. It presents the nature of science, integrating many of the ENSI NoS lessons. It's intended to replace or supplement chapter one in any science textbook, for grades 7-10. Unlike most textbooks, this booklet (with selected ENSI lessons) shows why pseudoscience is not science, how science is so often misrepresented and misunderstood, and why science is so effective in getting answers that work. It shows what science can and cannot use for explanations, and why that is, along with other important limits. An early version was field tested by about 20 teachers across the country, in middle school and high school classes. The feedback was very positive, and encouraging, with a number of constructive suggestions. The material (student book and Teacher Guide) are being revised to reflect those suggestions. It will be submitted for publication to the NSTA Press later this winter, or early Spring. Availability will be announced on our listserves.

NGSS: NEXT GENERATION SCIENCE STANDARDS
We are closely reviewing the second draft of the NGSS. We are looking especially at their NOS, Earth History, and Evolution components. With the first draft, we notified the NGSS committee that there needed to be a more explicit treatment of the nature of science. NSTA did likewise. The second draft reflects that feedback. Treatment of the Evolution and History of the Earth topics are also looking quite good. When these are finalized and adopted, we will make every effort to provide links to the many appropriate ENSI lessons. We already have a list of our lessons that are STEM-oriented.

AP BIOLOGY USING ENSI LESSONS
Changes in the AP Biology course materials have aligned nicely with several of the ENSI lessons. We are seeing significant increase in their use by AP Biology teachers.

NEW LESSON ABOUT TO BE ADDED: “BORN TO RUN”
Received in January, an exciting new lesson was submitted by Dr. Theodore Garland, Jr. of UC Riverside, and Dr. Tricia Radojcic of Bella Vista Middle School in Murietta, CA. The lesson “Born to Run: Artificial Selection Lab” was tested with 7th grade students by the second author, based on the research of Dr. Garland. The lesson provides the materials for a guided open-ended investigation into the anatomical effects of selecting mice for their speed in voluntary exercise-wheel running. This was done over many generations. Photos and data are accessible for students to test their hypotheses about the possible results of such selection. Included are several cross-curricular options for math and computer use, an ideal vehicle for satisfying STEM expectations.

HAVE A GREAT 2013 Larry Flammer, ENSI webmaster