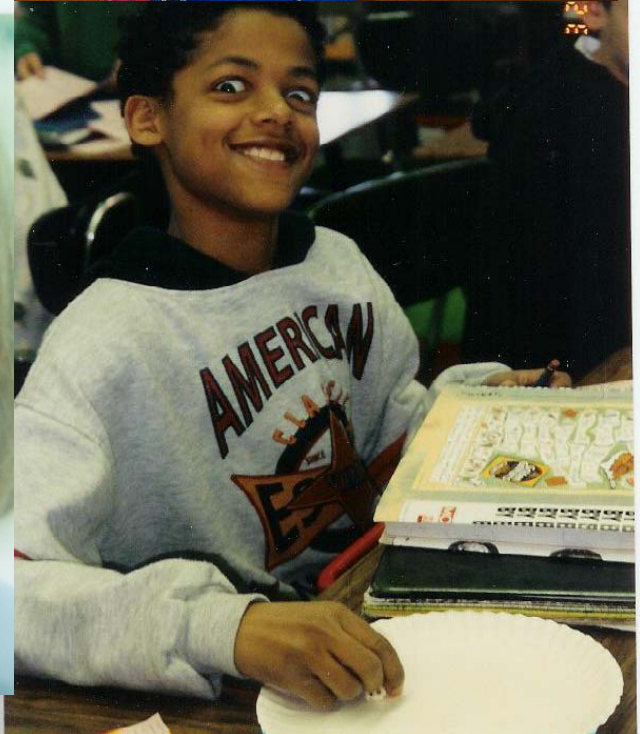


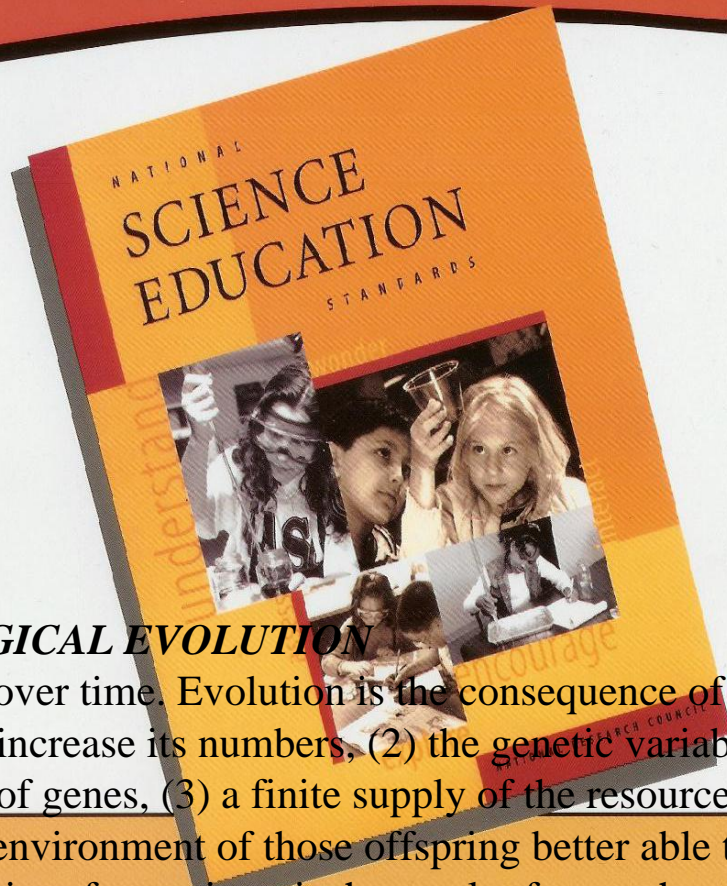


ADVANCING SCIENCE, SERVING SOCIETY

Evolution on the Front Line



National Science Education Standards



NSES: *BIOLOGICAL EVOLUTION*

- Species evolve over time. Evolution is the consequence of the interactions of (1) the potential for a species to increase its numbers, (2) the genetic variability of offspring due to mutation and recombination of genes, (3) a finite supply of the resources required for life, and (4) the ensuing selection by the environment of those offspring better able to survive and leave offspring. *
- The great diversity of organisms is the result of more than 3.5 billion years of evolution that has filled every available niche with life forms.
- Natural selection and its evolutionary consequences provide a scientific explanation for the fossil record of ancient life forms, as well as for the striking molecular similarities observed among the diverse species of living organisms.



Core Science Curriculum Framework

An Invitation for Students and Teachers
to Explore Science and Its Role in Society

1

BENCHMARKS FOR SCIENCE LITERACY



AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

PROJECT 2061

Benchmarks: **Grades 9 through 12**

Knowing what evolutionary change is and how it played out over geological time, students can now turn to its mechanism. They need to shift from thinking in terms of selection of individuals with a trait to changing proportions of a trait in populations. Familiarity with artificial selection, coming from studies of pedigrees and their own experiments, can be applied to natural systems, in which selection occurs because of environmental conditions. Students' understanding of radioactivity makes it possible for them to comprehend isotopic dating techniques used to determine the actual

AAAS Board Resolution on Intelligent Design Theory

The contemporary theory of biological evolution is one of the most robust products of scientific inquiry. It is the foundation for research in many areas of biology as well as an essential element of science education. To become informed and responsible citizens in our contemporary technological world, students need to study the theories and empirical evidence central to current scientific understanding.

NSTA Position Statement The Teaching of Evolution Introduction

The National Science Teachers Association (NSTA) strongly supports the position that evolution is a major unifying concept in science and should be included in the K-12 science education frameworks and curricula. Furthermore, if evolution is not taught, students will not achieve the level of scientific literacy they need. This position is consistent with that of the National Academies, the American Association for the Advancement of Science (AAAS), and many other scientific and educational organizations.

This textbook contains material on evolution. Evolution is a theory, not a fact, regarding the origin of living things. This material should be approached with an open mind, studied carefully, and critically considered.

Buttars Drafts Bill on Origins Teaching

Dec 24 2005 - Salt Lake Tribune

State Delays Update of Science Curriculum

Jan 26 2006 - Miami Herald

School Oversight Panel Takes No Stand in Evolution Debate

Jan 24 2006 - The State (Columbia, South Carolina)

Intelligent Design Policy is Rescinded

Jan 4 2006 - Post-Gazette (Pittsburgh, Pennsylvania)

Schools Nationwide Study Impact of Evolution Ruling

Dec 22 2005 - New York Times

In Kansas, Teaching Biology is Survival of Fittest

Dec 30 2005 - Chicago Tribune

Emotional Education Issues Ahead

Jan 10 2006 - Deseret News (Utah)

California School Sued Over Evolution Class

Jan 11 2006 - ABC News

State Science Standards Sent for Rewrite

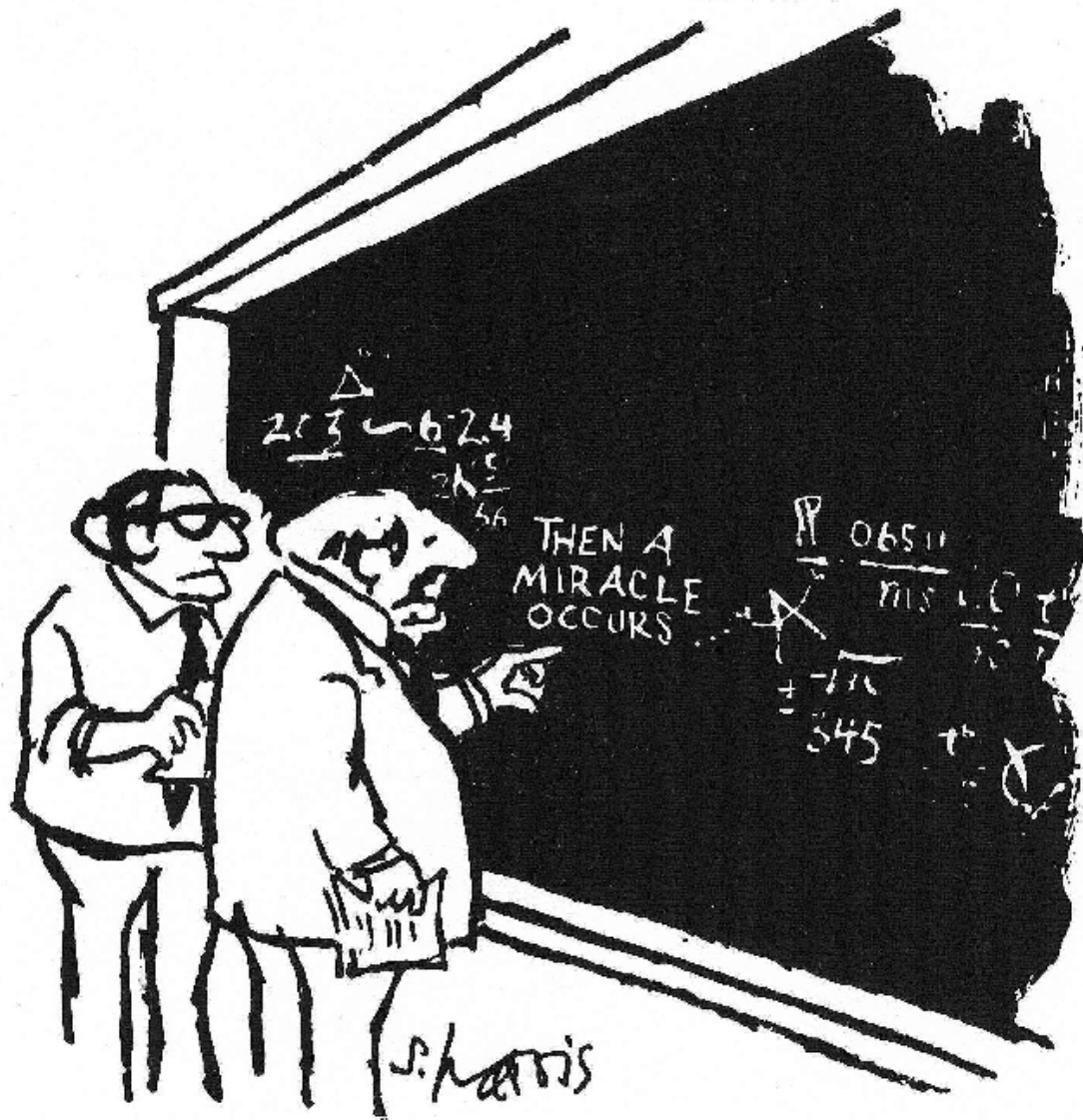
Jan 3 2006 - Journal-World (Lawrence, Kansas)



“Ruling a Victory for Keeping Religion Out of Science”

**Austin American-Statesman (Texas)
December 23, 2005**

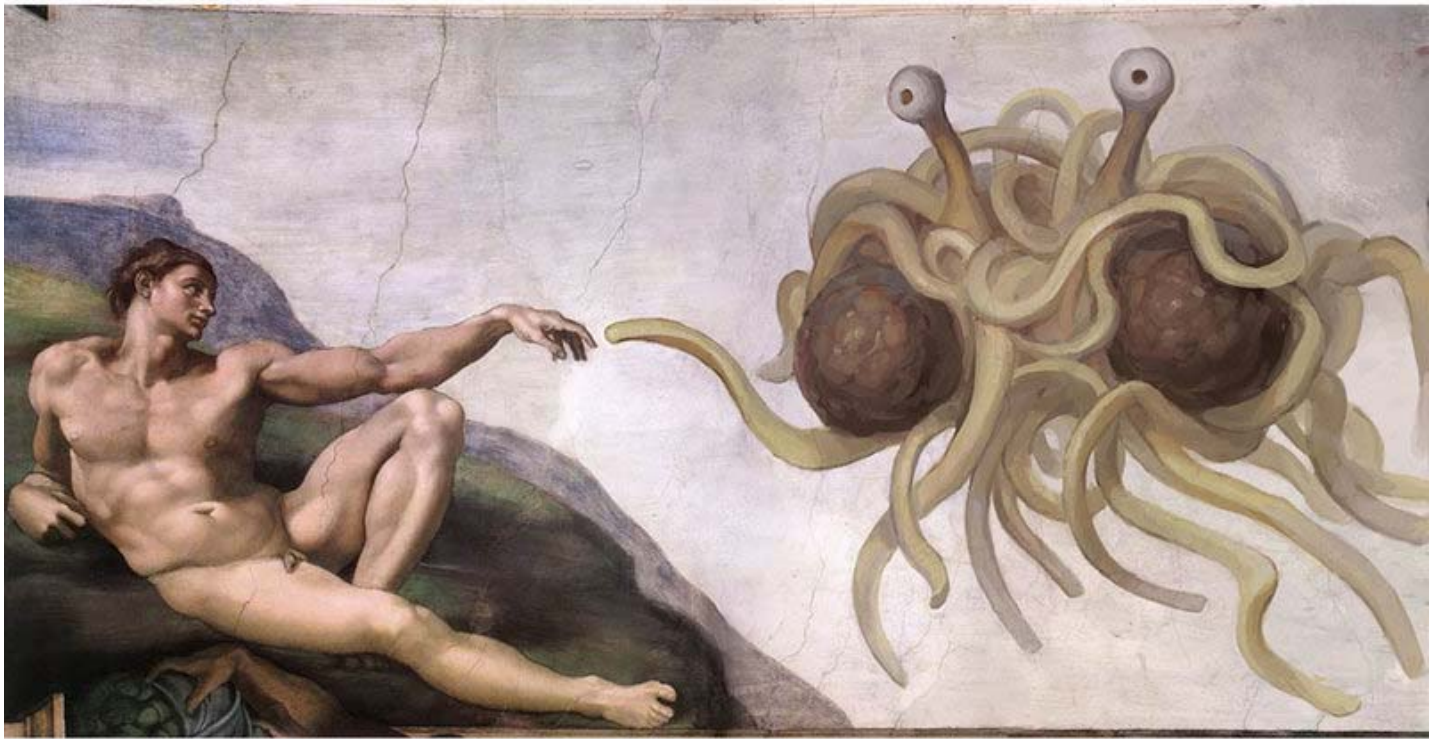




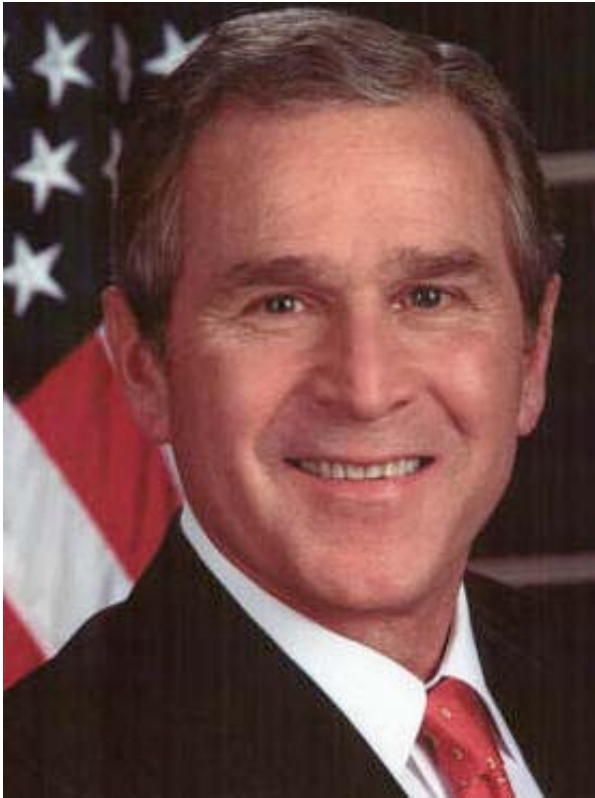
"I think you should be more explicit here in step two."

“Because Darwin’s Theory is a theory, it continues to be tested as new evidence is discovered. The Theory is not a fact. Gaps in the Theory exist for which there is no evidence. A theory is defined as a well-tested explanation that unifies a broad range of observations. Intelligent Design is an explanation of the origin of life that differs from Darwin’s view. The reference book, Of Pandas and People, is available for students who might be interested in gaining an understanding of what Intelligent Design actually involves. With respect to any theory, students are encouraged to keep an open mind. The school leaves the discussion of the Origins of Life to individual students and their families.”

Dover Area School Board



TOUCHED BY HIS NOODLY APPENDAGE



“... both sides ought to be properly taught ... so people can understand what the debate is about ... part of education is to expose people to different schools of thought ... you’re asking me whether or not people ought to be exposed to different ideas, and the answer is yes.”

**Knight Ridder Newspapers
August 1, 2005**

“Intelligent design is not a scientific concept.”

**- Dr. John H. Marburger, III (President’s Science Advisor)
The New York Times
August 3, 2005**

“School started this week and a lovely well-spoken
youngster came up to me and asked to be excused
any time that I referred to evolution in class.
I explained that that might be every day;

I asked her to let her parents know.”

Science department chair
Arizona

“There is an extremely vocal creationist minority in my community who call up the administration whenever I start to cover anything having to do with evolution.

Their students snigger and sneer in the classroom when even a video mentions anything having to do with [evolution].”

Science teacher
State unknown

Teachers are feeling they don't have administrative support.

“I’m very concerned about ID ... I’ve had to “educate” other science teachers. One, who had rejected creationism, thought he was keeping an open mind and listening to the real science of ID ... until I gave him some criticism from sources he accepted as unbiased. He now realizes that ID isn’t actually science, but he didn’t at first ... and **HE’S A SCIENCE TEACHER.**

The general public won’t be as motivated to do the extra investigation.”

Science teacher
New York

Teachers feel that they don't have the professional development to help them understand the dissention and address it.

“I think the most interesting experience I had was two years ago when a student came to me on the first day of school and asked me what she was going to work on while the other kids were studying Evolution.

I asked her why she thought she needed a "different" assignment than the other students.

She said it was because she didn't believe in Evolution and assumed, like sex education, that she would be exempt because of her beliefs.”

Science teacher
State unknown

**Teachers don't feel that they even
have the support of their
colleagues
in other departments.**

NSTA survey:

1/3 of teachers surveyed feel pressured to include creationism, intelligent design, or other non-scientific alternatives to evolution

The **Public Agenda** focus groups show that teachers in the heartland are feeling the threat --

- Messages from supervisors to not teach *human evolution*
- Students sitting out of class when it is taught
- Objections to the teaching of evolution
 - Lack of evolution questions on state tests

Public Agenda

"If you are going to teach it

TEACH IT!!"

Teachers who are successful:

- ▶ Respect and value views of their students.

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- ▶ Strive to “lower the temperature” of the conversation.

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- ▶ Respect and value views of their students.
- ▶ Strive to “lower the temperature” of the conversation.
- ▶ Understand how unfair it is to teach students anything but good science.
- ▶ Emphasize the importance of students understanding the Nature of Science.

What can scientists and the scientific community do to support teachers?

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- Talk to teachers,
offer to go into their classrooms

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- Talk to teachers,
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- Inform the community

What can scientists and the scientific community do to support teachers?

- Talk to teachers,
offer to go into their classrooms
- Inform the community
- Support professional development
for teachers

What can scientists and the scientific community do to support teachers?

- Talk to teachers,
offer to go into their classrooms
- Inform the community
- Support professional development
for teachers
- Serve as a role model



Thank you for this opportunity