

Full text of **O L O W History And Nature Of Science** conference

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History and Nature of Science

Please add ocean content under the appropriate standard

<http://books.nap.edu/html/nses/>

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Developing Student Understanding

Item 1 [Peter Tuddenham](#) Oct 22, 2004 18:53

Developing Student Understanding

K-4

<http://books.nap.edu/html/nses/6c.html#hn>

Beginning in grades K-4, teachers should build on students' natural inclinations to ask questions and investigate their world. Groups of students can conduct investigations that begin with a question and progress toward communicating an answer to the question. For students in the early grades, teachers should emphasize the experiences of investigating and thinking about explanations and not overemphasize memorization of scientific terms and information. Students can learn some things about scientific inquiry and significant people from history, which will provide a foundation for the development of sophisticated ideas related to the history and nature of science that will be developed in later years. Through the use of short stories, films, videos, and other examples, elementary teachers can introduce interesting historical examples of women and men (including minorities and people with disabilities) who have made contributions to science. The stories can highlight how these scientists worked--that is, the questions, procedures, and contributions of diverse individuals to science and technology. In upper elementary grades, students can read and share stories that express the theme of this standard--science is a human endeavor.

5-8

<http://books.nap.edu/html/nses/6d.html#hn>

Experiences in which students actually engage in scientific investigations provide the background for developing an understanding of the nature of scientific inquiry, and will also provide a foundation for appreciating the history of science described in this standard.

The introduction of historical examples will help students see the scientific enterprise as more philosophical, social, and human. Middle-school students can thereby develop a better understanding of scientific inquiry and the interactions between science and society. In general, teachers of science should not assume that students have an accurate conception of the nature of science in either contemporary or historical contexts.

To develop understanding of the history and nature of science, teachers of science can use the actual experiences of student investigations, case studies, and historical vignettes. The intention of this standard is not to develop an overview of the complete history of science. Rather, historical examples are used to help students understand scientific inquiry, the nature of scientific knowledge, and the interactions between science and society.

9-12

<http://books.nap.edu/html/nses/6e.html#hn>

The National Science Education Standards use history to elaborate various aspects of scientific inquiry, the nature of science, and science in different historical and cultural perspectives. The standards on the history and nature of science are closely aligned with the nature of science and historical episodes described in the American Association for the Advancement of Science Benchmarks for Science Literacy. Teachers of science can incorporate other historical examples that may accommodate different interests, topics, disciplines, and cultures--as the intention of the standard is to develop an understanding of the human dimensions of science, the nature of scientific knowledge, and the enterprise of science in society--and not to develop a comprehensive understanding of history.

Scientists have ethical traditions. Scientists value peer review, truthful reporting about the methods and outcomes of investigations, and making public the results of work.

Little research has been reported on the use of history in teaching about the nature of science. But learning about the history of science might help students to improve their general understanding of science. Teachers should be sensitive to the students' lack of knowledge and perspective on time, duration, and succession when it comes to historical study. High school students may have difficulties understanding the views of historical figures. For example, students may think of historical figures as inferior because they did not understand what we do today. This "Whiggish perspective" seems to hold for some students with regard to scientists whose theories have been displaced.

9-12 Science as human endeavor

Item 2 [Peter Tuddenham](#) *Oct 22, 2004 19:14*

9-12 Science as human endeavor

Response 2:1 [Gabrielle Johnson](#) *Oct 27, 2004 18:16*

The sea of cortex might be a great intro to this

5-9 Science as human endeavor

Item 3 [Peter Tuddenham](#) Oct 22, 2004 19:14

5-9 Science as human endeavor

K-4 Science as human endeavor

Item 4 [Peter Tuddenham](#) Oct 22, 2004 19:15

K-4 Science as human endeavor

Response 4:1 [Lynn Whitley](#) Oct 28, 2004 04:18

ocean exploration (submersibles, etc)

Response 4:2 [Francesca Cava, Nat. Geo. Society, Santa Barbara, California](#) Oct 28, 2004 10:35

Influence of oceanography on past events (ie, circumnavigation of the Earth; ship groundings, change in coastlines due to sea level rise)

9-12 Nature of scientific knowledge

Item 5 [Peter Tuddenham](#) Oct 22, 2004 19:16

9-12 Nature of scientific knowledge

5-9 Nature of science

Item 6 [Peter Tuddenham](#) Oct 22, 2004 19:17

5-9 Nature of science

Response 6:1 [Allison Whitmer](#) Oct 27, 2004 12:32

The field of intertidal ecology has made major contributions to experimental science. There is clearly a link that can be made here that is compelling and relevant.

9-12 Historical perspectives

Item 7 [Peter Tuddenham](#) Oct 22, 2004 19:17

9-12 Historical perspectives

5-8 History of science

Item 8 [Peter Tuddenham](#) Oct 22, 2004 19:18

5-8 History of science

Response 8:1 [Gabrielle Johnson](#) Oct 27, 2004 18:17

Students love to hear about the history of oceanography: first ways depth was measured, submarine exploration and the history of SCUBA.

Response 8:2 [Gabrielle Johnson](#) Oct 28, 2004 12:59

navigational tools might also fall under this tying into exploration

Response 8:3 [Gene Williamson](#) Oct 28, 2004 14:04

There are a wide variety of samplers that kids can construct in the classroom and use in their own environment. These would connect historical ocean to real-time studies of everything from population dynamics to sedimentation.

K-12 other topics

Item 9 [Peter Tuddenham](#) Oct 22, 2004 19:18

K-12 other topics
