

Perspectives on Science and Mathematics

Many math and science students are surprised to learn that math and science *have* a history at all; so far as they know, math and science have simply been handed down in textbooks. To discover that science has been accomplished by different kinds of people, for different kinds of reasons, in different kinds of places, can be truly mind-boggling, and, for many students, illuminating. Science is not just a matter of finding out the predetermined right answer! While some students are irked or even frightened by this discovery, others find it liberating.

Perspectives has several interlocking purposes:

- It is intended to help future math and science teachers learn how to think about math and science “from the outside”—to ask questions about what scientists and mathematicians do and why, about where science and technology came from and how they got to be so important in the world today, and about what kinds of questions scientists and mathematicians have tried to answer and why.
- It is designed to teach students skills of the liberal arts, including sophisticated research and information analysis, fluent writing, and substantive argument.
- It requires students to put to work all the perspectives and skills they have learned in science and math pedagogy.

Four common elements show up in Perspectives: thinking about science and math “from the outside,” improving students’ writing skills, improving students’ research skills, and incorporating history and/or philosophy of science and math into pedagogy.

Course Objectives: Perspectives

Students Will Be Able To:	Evidence (Student Products)
Develop an overview of the development of modern science and mathematics from the seventeenth through the twentieth centuries	Two quizzes on historical material Weekly writing assignment responding to an issue or question raised Two historical papers requiring research and analysis Participation in class and weekly section discussions
Examine the underpinnings of modern science and mathematics by analyzing the contributions of key individuals, including Newton and Darwin	Two quizzes on historical material Participation in class and weekly section discussions Weekly writing assignment responding to an issue or question raised Two research papers on aspects of the development of science and math
Express ideas and opinions clearly and effectively using a formal writing style	Weekly writing assignment responding to an issue or question raised 1,700-word research paper 3,500-word research paper

<p>Develop skills in searching for, retrieving, and evaluating the provenance and reliability of source materials, including specific resources available to teachers</p>	<p>One research-skills quiz Annotated bibliographies for two historical papers Research skills workshop with university librarian</p>
<p>Integrate approaches and material learned in the course with independent research and science or math content to design middle and high school science and math lessons</p>	<p>One 5E lesson plan designed for middle or high school students that addresses standards and integrates approaches and material learned in the course with independent research and science or math content 5E lesson taught to peers Feedback on 5E lessons provided by peers</p>