

SATURDAY ENRICHMENT SPRING 2022

Pseudo/Science: Analyzing Scientific Claims

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Location: Mary Gates Hall, Room 228

Course Description

The modern world is filled with controversial, confusing, and often frustrating claims about science. How much of a problem is climate change? Are vaccines really safe? Should creationism be taught alongside evolution in schools? This course can't answer those questions, however, it aims to help students cut through the scientific noise so they can think about, and evaluate, contentious claims for themselves. Each week we will examine a different event in the history of science to learn how scientists dealt with controversy during their lifetime. Through this examination, students will learn critical thinking skills and gain historical perspective to better understand the world we live in today. Students will look at past scientific controversies through simulations that include drawing, discussions, brainstorming, social games, and more.

Learning Outcomes

By the end of this course students should be able to:

- analyze scientific claims based on the strength of the evidence behind them.
- form strong, clear arguments using historical examples.
- apply evidence to original arguments.
- evaluate and identify the nuance in complex issues.

Instructional Strategies

Each class session will consist of three fairly equal parts. I will start with a brief lecture about the week's topic. From there, students will come up with their own solutions to problems posed in the lectures. The last part of the class will be spent sharing and discussing students' work to gain a better group understanding of the problems examined.

Resources and Materials

Students will be provided with modeling clay, drawing/writing materials, and primary sources in each class.

Tentative Course Schedule

Date	Topics	Class Activities
Week 1 April 2	<i>Pseudoscience and you.</i>	We often hear claims that things are pseudoscientific—astrology, flat-earthism, climate change denial, etc. This class will examine nuances around pseudoscience and some historical examples of it. After that, students will come up

		with their own methods of telling science from pseudoscience and work to apply it to real world examples.
Week 2 April 9	<i>When genetics fail the farm: Lysenkoism in the Soviet Union.</i>	What happens when science becomes too politically motivated? We'll examine Russia's mid-20 century rejection of modern genetic teaching for an alternative theory called Lysenkoism. We will look at the effects that had on the Soviet Union, and students will work towards how to keep science free of corruption and undue government influence.
Week 3 April 16	<i>The not-so-controversial history of evolution.</i>	Teaching evolution in American schools is controversial. However, evolution by natural selection was not controversial amidst scientists and the public when Darwin posited the idea. We'll see how Darwin set up his theory to be non-controversial, and students will work on a simulation to learn how to back up their arguments with evidence.
Week 4 April 23	<i>The history of flat earth.</i>	We'll examine the history of the fringe idea that the earth is flat. Flat-earthism is a relatively recent idea, despite the popular misconception that it is an ancient idea. Examining the new history of flat-earthism, students will learn the importance of looking through primary evidence and evaluating evidence for themselves.
Week 5 April 30	<i>I want to believe: Life on other worlds.</i>	This class will go over historical and contemporary arguments about the existence of extraterrestrial life. In doing so, students will come up with their own methods of finding life on other worlds.
Week 6 May 7	<i>Velikovskyism and the Scientific Community.</i>	In 1950 Immanuel Velikovsky published <i>Worlds in Collision</i> . This book was wildly popular and, if true, would entirely rewrite modern science and history. This class examines how the established scientific community responded. Students will discuss the implications of the scientific community's reaction to alternative ideas.
Week 7 May 14	<i>Divining Rods and Mesmerism.</i>	The practice of divining—finding underground water, metals, and even solving crime— was a sensation in 17th and 18th century France. At a similar time, mesmerism—the idea that you could heal somebody based on manipulation of their aura—also flourished. These two science-like doctrines forced French scientists to confront what it really meant for something to be scientific. Through the framing of these events students will come up with their own solutions for standards and ethics in science.

Week 8 May 21	<i>Complicating the picture: Astrology and alchemy.</i>	During this last class students will reflect on what they have learned about argumentation, evidence, and science. To complicate the picture, I will go over two examples where science, mysticism, and pseudoscience seem inseparable: astrology and alchemy. Through these topics, students will model how even somewhat clear pictures can have multiple sides and nuance.
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